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1823.

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1862, Nov. 18
Gift of
Richard Green Parker, Esq.
of Cambridge.
(Class of 1817.)

DISTRICT OF VIRGINIA, TO WIT:

L. S. BE IT REMEMBERED, that on the twentieth day of March, in the forty-sixth year of the Independence of the United States of America, George Marshall, of the said District, hath deposited in this office the title of a book, the right whereof he claims as author, in the words following to wit: "Marshall's Practical Marine Gunnery; containing a view of the magnitude, weight, description and use, of every article used in the Sea Gunner's department in the Navy of the United States—By George Marshall —Norfolk: printed by Thomas G Broughton, at the Office of the Norfolk and Portsmouth Herald—1822." In conformity, to the act of the Congress of the United States, entitled, "An act for the encouragement of learning, by securing the copies of maps, charts, and books to the authors and proprietors of such copies during the time therein mentioned."

RICHARD JEFFRIES.
Clerk of the District of Virginia.

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THIS Book has been strictly examined by some of the most experienced Officers in the United States' Navy, particularly by Captains ARTHUR SINCLAIR, LEWIS WARRINGTON and WILLIAM M. CRANE, and they have authorized me to say that they consider it a useful work for all classes of Officers, but more particularly for the junior class.

THE AUTHOR.

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magnitude, that in the opinion, of some of our most distinguished and scientific commanders, admit of extensive practical utility, and consequently justify publication.

But notwithstanding such assurances of success from those best qualified to judge, this little miscellany is submitted to the press, with extreme diffidence and apprehension.

The Author is an unlettered man, and even unacquainted with the grammatical parts of the English language—Unaided therefore, by any other means of acquiring information, the following Tables and Calculations have been formed solely from actual observations, made while in the performance of professional duties—accordingly they are destitute of every advantage of language.

But, though a refined and harmonious taste, would be disgusted at the harshness of their uncouth technicality, yet as they are only expected to give a tolerable circulation, among the Author's professional brethren, he hopes, that the conciseness and perspicuity of terms he has

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A LIST

OF

SEA STORES AND OUTFITS

REQUIRED

To equip a Man of War

FOR

A CRUIZE.

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To equip a Man of War

FOR

A CRUIZE.

SEA STORES.

To every 20th gun, 1 carriage to spare, from a frigate up to a 110 gun ship.

Gun Beds, 1 to every 10 guns.

Gun Quoins, do. do.

Gun Trucks, 2 to every 10 guns—one aft and one forward.

Vessels carrying less than 10 guns, 4 trucks—2 aft and 2 forward.

Tompions, 1 to every 2 guns.

Handspikes, 1 to every 2 guns.

Spunge Heads, 1 to every 10 guns.

Vessels carrying less than 10 guns, 2.

Rammer Heads, 1 to every 10 guns.

Vessels carrying less than 10 guns, 2.

Paper Cartridge Formers, 1 to every 20 guns.

Vessels carrying less than 20 guns 2.

Cylinder Formers, 1 to every 20 guns.

Vessels carrying less than 20 guns, 2,

Wad Formers, 1 to every 10 guns.

Shot Formers, 1 to every 20 guns.

Vessels carrying less than 20 guns, 2,

Gun Locks, 1 to every 5 guns.

Gun Tackles, 1 to every 4 guns.

Hooks and Thimbles, 2 to each gun.

Gun Breechings, 1 to every 2 guns.

Muzzle Bags, 1 to every 5 guns.

Match Staffs, 1 to every 10 guns,

Portfire Staffs, 1 to every 20 guns.

Vessels carrying less than 20 guns, 2.

Lead Aprons, 1 to every 10 guns.

Gunner's Quadrant, 1 to each vessel.

OUTFITS.

FOR long guns, 1 carriage complete to each gun.
Gun Beds, 10 to every 10 guns.
Gun Quoins, do. do.
Tompions, 1 for every gun.
Handspikes, 1 for every gun.
Crowbars, 1 to each gun.
Worms, 1 to every 2 guns.
Ladles, 1 to every 2 guns.
Passing Boxes, 3 to every 2 guns.
Wads, 100 to every gun.
——— 200 to every Bow and Stern Chaser.
Gun Scrapers, 1 to every 10 guns.
Shot Tongs, 1 to every 20 guns.
Round Shot, 100 to each gun, and 200 to each Bow and Stern Chaser.
Stands of Grape, 30 to the gun.
Cannister, 20 to each gun.
Doubleheaded Shot, 15 to each gun.
Langrage, 10 to each gun.
Bar Shot, 10 to each gun.
Gun Locks, 1 to every gun.
Gun Tackles, 3 to every gun.
Flannel Cylinders, 100 to each gun.
Bow and Stern Chasers, 200 to each.
Gun Breechings, 1 to every gun.
Muzzle Bags, 1 to every gun.
Match Tubs, 1 to every gun.
Match Staffs, 1 to every gun.
Salt Boxes, 1 to every gun.
Lead Aprons, 1 to every gun.
Powder Horns, 1 to every 2 guns.

SEA STORES.

Linch Pins, 2 to every 5 guns.
Division Bags, 2 to every 5 guns.
Gun Slings, 1 to every 10 guns.
Muzzle Lashings, 1 to every 5 guns.
Mallet and Spikes, 1 to every 5 guns.
Tube Boxes and Belt, 1 to every 5 guns.
Double Blocks, 1 to every gun.
Single Blocks, 1 to every gun.
Hooks and Thimbles for breechings, 1 for every 2 Bow Chasers and 2 for every Stern, do.
Spunge Staffs, 1 to every 5 guns.
Iron Toggles for Triggers, 1 to every 5 guns.
Spunges, 1 to every 5 guns.
Rammers, 1 to every 5 guns.
Clamps, 2 to every 5 guns.
Wooden Toggles, 1 to every 5 guns.
One Pound of Soap to each gun.
Loggerheads, 1 to every 5 guns.
Yards of Flannel for the making of 25 Cylinders to each gun.
Yards of Green Baize, 1 yard to each gun.
Yards of Canvas, 2 yards to each gun.
Do. Fearnought, 1 yard to each gun.
Vessels above 44 guns, 2 yards.
Yards of Duck, 1 yard to each gun.
Do. of India Cotton, half a yard to each gun.
Gallons of Lamp Oil, 8 gallons to each lamp.
Pounds of Spermaceti Candles, 25lbs. to each gun.
Pounds of black Pepper, 2 ozs. to each gun.
100 Charges of Powder to each gun full.
Bow and Stern Chasers, 200 to each.

OUTFITS.

Powder Flasks, copper, 1 to every gun.
Priming Wires, 2 to every gun.
Boring Bits, 1 to every gun.
Division Bags, 2 to every 5 guns.
Muzzle Lashings, 1 to every gun.
Battle Lanterns, 1 to every gun, Bow and Stern Chasers, 2 to each.
Shot Boxes, 2 to every gun.
Mallet and Spikes, 1 to every gun.
Tube Boxes and Belt, 1 to every gun.
Quilt Tubes, 100 to each gun, Bow and Stern Chasers, 200 to each.
Hooks and Thimbles, for Breechings, 2 for every Bow and Stern Chaser.
Iron Toggles for Triggers, 1 to every gun.
Sponges, 1 to every gun.
Rammers, 1 to every gun,
Wooden Toggles, 2 to every gun.
Muskets, 3 to every 2 guns.
Brass Musket Moulds and Musket Scrapers, 1 of each to every 20 guns.
Vessels carrying less, 2 pair.
Musket Worms to every 20 muskets, 1 to every 20 guns.
Do. Cartridge Formers, 1 to every 10 muskets.
Cartridge Box and Belt, 1 to every musket.
Cast Iron Pot, 1 to each vessel.
Prickers and Brushes, 1 to each musket.
Boarding Pikes, 2 to every gun.
Boarding Caps, 3 to every gun.
Arm Chests, 1 to every 10 guns.

SEA STORES.

25 Pounds of priming Powder to each gun.
Goose Quills, 50 to each gun.
Pounds of Worsted Yarn, 4 ozs. to each gun.
Do. of Wick Yarn, 1 oz. to each gun.
Dozens of Patent Wick, 5 dozen to each gun.
Hides of Bellows Leather, 1 to every 10 guns.
Do. of Buck Leather, 1 to every 20 guns.
Do. of Half-tanned Leather, 1 to every 10 guns.
Pounds of Pig Lead, 10lbs. to each gun.
Ounces of Bees Wax, 1 oz. to each gun.
Sewing Thread, 2 ozs. to each gun.
Pump Tacks, 100 to each gun.
Pump Hammers, 1 to every 10 guns.
Sheep Skins, dressed, 2 to each gun.
Drum Heads, 4 to each drum.
Sewing Twine, 8 ozs. to each gun.
Marline, 4 ozs. to each gun.
Housline, 6 ozs. to each gun.
Skeins of Hamber Line, 1 skein to each gun.
Do. of Log Line, half a skein to each gun.
Spun Yarn, assorted, 6lbs. to every gun.
Match Rope, 25lbs. to every gun.
Breechings, 1 to every 2 guns.
Rope for Gun Tackles, 8 times the length of the gun for every gun.
9-Thread, 10 fathoms to every gun.
Vessels under 44 guns, 8 fathoms.
Vessels under 22 guns, 6 fathoms.
6-Thread, 10 fathoms to each gun.
Vessels of 44 guns, 8 fathoms.
Vessels under 22 guns, 6 fathoms.

OUTFITS.

Rifles, 2 to every 10 guns.
Do. Balls, 100 to each rifle.
Repeating Swivels, or 7 barrel pieces, 1 to every 10 guns.
Rammers, 1 to each piece.
Powder Measures, 1 to each.
Moulds and Prickers, 2 to each.
Lead Balls, 630 to each.
Brass Hammer, 1 to each.
Night Signal Chest, 1 to each vessel.
Cutlasses, 3 to every 2 guns.
Tomahawks, 1 to every gun.
Howitzers, 2 to each vessel.
Swivels, 1 to every 20 guns.
Blunderbuss, 1 to every 10 guns.
Flash Pistols, 2 to every vessel.
Pistols, to every 2 guns.
Scrapers and Worms, 1 to every 10 pistols.
Repeating Pistols, 1 to every 5 guns.
Scraper and Worm, 1 to every 2 pistols.
Powder Measures, 1 to every 2 pistols.
Brass Moulds and Iron Prickers, 1 to every 2 pistols.
Balls, 25 for each pistol.
Skeins of Logline, 1 skein for 8 guns.
Do. of Hamberline, 1 skein for 8 guns.
Buck Shot Cartridges, filled, 50 to every musket.
Ball Cartridges, filled, 100 to each musket.
Blank Cartridges, filled, 25 to each musket.
Barrels to contain 1000 Cartridges to each barrel.
Pistol Cartridges, filled, 50 to each pistol.
Brass Pistol Moulds, 1 to every 20 pistols.
Cartridge Box and Belt, 1 to every pistol.

SEA STORES.

Fathoms of 4-Thread, 10 fathoms to every gun.
Vessels under 44 guns, 8 fathoms.
Do. . . . . 22 guns, 6 fathoms.
Reams of Cartridge Paper, 2 quires to each gun.
Musket Cartridge Paper, 1 do. to each musket.
Pounds of Glue, 1lb. to every 20 guns.
Pounds of Black Lead, 1lb. to every gun.
Sheets of Sand Paper, 6 sheets to every gun.
Pounds of Musket Balls, 25lbs. to each musket.
Pounds of Isinglass, 1lb. to every 20 guns.
Pistol Balls, 15lbs. to each pistol.
Pistol Flints, 15 to each pistol.
Gun Flints, 25 to each gun.
Ounces of Emery, 1 oz. to each gun.
Do. of Rotten Stone, 1 oz. to each gun.
Bottles of Sweet Oil, 1 bottle to every 5 guns.
Pairs of Pincers, 4 pair to every vessel.
Reflecting Glass, 1 to every vessel.
Sail Needles, 3 to each gun.
Marline Needles, 1 to every gun.
Sewing Needles, assorted, 5 to every gun.
Palm Plates, 1 to every 5 guns.
Shoemakers' Awls, 1 to every 20 guns.
Vessels carrying less than 20 guns, 2.
Shoemakers' Thread, 1lb. to every 20 guns.
Hog's Bristles, half an ounce to every 20 guns.
Setting Fids, assorted, 1 to every 20 guns.
Marlinespikes, 1 to every 5 guns.
Serving Mallets, assorted, 1 to every 5 guns.
Lignum Vitæ Fids, assorted, 1 to every 5 guns.
Flat Bar-Iron, 30lbs. to each gun.

OUTFITS.

Pistol Cartridge-formers, 1 to every 20 pistols.
Sheets of Lantern, 6 sheets to each gun.
Barrel to contain 1000 cartridges to each barrel.
Brass Callippers, 1 to every vessel.
Pairs of Dividers, 2 pair to every vessel.
Do. of Scissors, 3 pair to every vessel.
Do. of Shears, 2 pair to every vessel.
Do. of Sheep Shears, 1 to every 20 guns.
Vessels carrying less than 20 guns, 2.
Tailors' Thimbles, 1 to every 20 guns.
Vessels carrying less, 2.
Small Iron Graplin, 2 to every vessel.
Fire Buckets, 11 to every 10 guns.
Tube Chest, 1 to every vessel.
Drums, 2 to every vessel—Fifes, 2 to every vessel.
Magazine Dresses, 4 to each magazine.
Fire Tubs, 2 to every magazine passage.
Brass Magazine Locks, 2 to each magazine.
Hair Brooms, 2 to do.
Water Cans, 1 to do.
Powder Measures, assorted, 1 to every 10 guns.
Vessels carrying less than 10 guns, 3.
Copper Knives, 3 to each magazine.
Do. Funnel, 1 to every 20 guns, vessels carrying less than 20 guns, 2.
Copper Scoops, 2 to each magazine.
Do. Shovels, 1 to each magazine.
Brass Wire Sieve, 1 to every magazine.
Copper Adze, 2 to each magazine.
Do. Vice, 2 to do.
Brass Drivers, 2 to do.

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To equip a Man of War

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OUTFITS.

Two Chince Hammers for Tinker.

Abstract Book, 1 for every vessel, Day Book, 1 for every vessel.

Receipt Book, 1 for do. Penknife, 1 for do.

Slate, 1 for do. Ink Stand, 1 for do.

Sand Box, 1 for do. Ruler, for do. do.

Writing Desk complete, Vessels carrying less than 36 guns, no occasion for one.

A TABLE

Of the Length and Dimensions of the Apparatus necessary for the Equipment of a Long Gun.

THIRTY-TWO POUND LONG GUN.

Handspike to be the length of the Carriage.

Crow Bar the same.

Width of the Cylinder, 17½ and 1-10.

Length of do. 18½ inches.

Gun Tackle Blocks, 12 inches.

Rope for Tackle-falls, size 3½ inch.

Length, four times the length of the gun.

Breechings size, 8 inches, length of the same, 3 times the length of the gun.

Thread-seizing for the Breeching, 9-thread, 18 feet long, 7 and 6 turns.

Quarter-seizing for do. 16-thread, 15 feet long, 6 and 5 turns.

End-seizing, for do. Housline, 12 feet long, 5 and 4 turns.

Seizing for Gun Tackle Blocks, Housline, 10 feet long, 6 and 5 turns.

Size of the Strap for Tackle-blocks, 3½ inch.

Length of Strap for Double-blocks, 4 feet 9 inches.

Do. for single-blocks, 4 feet.

Length of 2-Yarn Spun Yarn, to serve single-block Straps, 12 ozs.

Do to serve Double, do. 1lb.

Length of the Rammer is the length from the Breech Ring to the face of the gun.

Length of the Rammer-head, 1¼ diameter of the bore;

EQUIPMENT OF LONG GUNS.

Length of the Spunger, 18 inches longer than the Rammer.

Do. of the Spunge-head, 1½ diameter of the bore.

The thickness of do. do. ¾ of an inch smaller than the bore.

One Sheep Skin covers 2 Spunges.

Three Yards and 1 foot of Flannel, ¾-wide, makes 9 Cylinders.

Diameter of the Shot, 1-10 smaller than the bore of the piece.

Length of the Worm is the length of the Spunger.

Length of the Ladle is the length of the Rammer.

Half an Ounce of Thread makes 30 Cylinders.

Diameter of a Stand of Grape as the Shot, 32lbs.

One Yard 4-inches American Canvas, 2 feet, makes 3 stand of Grape.

One Ounce of Marline will quilt 1 stand of Grape.

Half an Ounce of Marline for Seizing.

One fourth of an Ounce of Twine for sewing the Bag.

Once the Diameter of the bore is the length of the Tompion.

The weight of a Flemish Wad is 34 ozs.

It takes 40 ozs. of Junk to make a Wad, with wastage.

Once the Diameter of the Grape-shot, 2 inches 4-16 and 1-20, weighing 29 ozs.

12lb. Round Grape-shot makes 1 stand of Grape.

Thickness of Spunge-head, ¾ smaller than the bore.

TWENTY-FOUR POUND LONG GUN.

Handspike, length of the Carriage.

Crow Bar, length of the same.

EQUIPMENT OF LONG GUNS.

Width of the Cylinder, 15 inches, length of do. 17 inches.

Size of Gun Tackle-blocks, 11 inches.

Do. of Rope for Tackle-falls, 3¼-inch, length of the fall four times the length of the gun.

Size of Rope for Breeching, 7½ inches.

Length of do. 3 times the length of the gun.

Thread-seizing for do. 9-Thread, 17 feet, 10 inches long, 7 and 6 turns.

Quarter-seizing for do. 6-Thread, 14 feet, 10 inches long, 6 and 5 turns.

End-seizing for do. 4-Thread, 11 feet, 10 inches long, 5 and 4 turns.

Seizing for Gun Tackle-blocks, Housline length, 9 feet, 11 inches.

Size of Rope for Gun Tackle Block-straps, 3¼-inch.

Length of Strap for Double-blocks, 4 ~~fathoms~~ 7 inches, do. for Single-blocks, 4 ~~fathoms~~ feet.

2-Yarn Spun-yarn to ~~serve~~ Double Block-straps, 1lb.

Do. to serve single Block-straps, 12 ozs.

Length of the Rammer is the length from the Breech Ring to the face of the gun.

Length of the Rammer-head, 1¼ diameter of the Bore.

Do. of the Spunger, 18 inches longer than the Rammer.

Do. of the Spunge-head, 1½ diameter of the Bore.

One Sheep Skin covers 2 Spunges.

Two yards of Flannel, ¾-wide, makes 7 Cylinders.

Diameter of the Shot, 1-10 smaller than the Bore of the piece.

Length of the Worm is the length of the Spunger.

Do. of the Worm is the length of the Spunger.

EQUIPMENT OF LONG GUNS.

Length of the Ladle is the length of the Rammer.

Half an Ounce of Thread makes 30 Cylinders.

Diameter of a stand of Grape is the diameter of the Shot, weight, 24.

Thirty-four inches of Canvas, makes 4 stand of Grape.

One Ounce of Marline to quilt 1 stand of Grape.

Half an Ounce of Marline to seizing 1 stand of Grape.

Quarter of an Ounce of Twine for sewing 1 Bag.

Diameter of the Bore is the length of the Tompion.

The weight of a Flemish Wad is 28 ozs.

Thirty-three Ounces of Junk to make 1 Wad, with wastage.

The diameter of the Grape-shot, 2 inches and 3-10, wt. 24 ozs.

The thickness of the Spunger-head, ⅓ smaller than the Bore.

EIGHTEEN POUNDER LONG GUN.

Handspikes to be the length of the Carriage.

Crow Bar the same.

Width of the Cylinder, 14½ inches and 3-10, length of do. 16 inches.

Gun Tackle-blocks, 10 inches.

Size of Rope for Gun Tackle-falls, 3-inch.

Length of the Fall, 4 times the length of the gun.

Size of Rope for Breechings, 6½-inch, length of do. 3 times the length of the gun.

Thread-seizing for Breeching-size, 6-Thread, 17 feet, 6 inches long, 7 and 6 turns.

Quarter-seizing for do. 4-Thread, 14 feet, 6 inches long, 6 and 5 turns.

EQUIPMENT OF LONG GUNS.

End-seizing for Breeching-seize Housline, 11½ feet long, 5 and 4 turns.

Seizing for Gun tackle block straps Housline, 9 feet, 9 inches long.

Size of Straps for Gun tackle blocks, 3 inches.

Length of the double block Straps, 4 feet, 5 inches.

Do. of the single do. 4 feet.

2-Yarn Spun-yarn to serve double block straps, 1lb.

Do. do. single block straps, 12 ozs.

The length of the Rammer is the length from the breech ring to the face of the gun.

Length of the Rammer-head, 1¼ diameter of the bore.

Do. of the Spunger, 18 inches longer than the rammer.

Do. of the Spunge-head, 1¼ diameter of the bore.

Two Sheep skins cover 5 spunges.

Two yards 11 inches of Flannel, ¾-wide, make 10 cylinders.

Diameter of the Shot, 1-10 smaller than the bore of the piece.

Length of the Worm is the length of the spunger.

Do. of the Ladle is the length of the rammer.

Half an ounce of Thread makes 30 cylinders.

Diameter of a stand of Grape is the diameter of the shot wt. 18lbs.

Thirty-four inches of Canvas, makes 4 stand of grape.

One ounce of Marline to quilt 1 stand of grape.

Half an ounce of Marline for seizing do.

Quarter of an ounce of Twine for sewing the bag.

Diameter of the Bore is the length of the tompion.

EQUIPMENT OF LONG GUNS.

The weight of a Flemish Wad is 23 ozs.

Twenty-seven ounces of Junk to make a Wad, with wastage.

The diameter of a Grape-shot, 2 1-10, the weight, 15¼ ounces.

Twelve Grape-shot will make 1 stand of grape.

The thickness of the Spunger-head, ⅛ smaller than the bore.

TWELVE POUND LONG GUN.

Hankspike to be the length of the carriage.

Crow Bars the same.

Width of the Cylinder, 14 3-10 inches, length of do. 15 inches.

Size of Gun tackle blocks, 9 inches.

Size of Rope for Gun tackle falls, 2¾ inches.

Length of the Falls, 4 times the length of the gun.

Size of the Rope for breeching, 6 inches.

Length of do. for do. 3 times the length of the gun.

Thread-seizing for breeching, 6-Thread, 17 feet 5 inches long, 7 and 6 turns.

Quarter-seizing for do. 4-Thread, 14 feet 5 inches long, 6 and 5 turns.

End-seizing for do. Housline, 11 feet 5 inches, 5 and 4 turns.

Seizing for the Gun tackle block straps, Housline, 9 feet 8 inches.

Size of Straps for Gun tackle blocks, 2¾ inches.

Length of Strap for double blocks, 4 feet 4 inches.

Do. for Single blocks, 3 feet 10 inches.

EQUIPMENT OF LONG GUNS.

2-Yarn Spun-yarn to serve double block straps, 12 ozs.

Do. to serve single block straps, 8 ozs.

The length of the Rammer is the length from the breech ring to the face of the gun.

Length of the Rammer-head, 1¼ dimameter of the bore.

Do. Spunger, 18 inches longer than the rammer

Do. do. of head, 1½ diameter of the bore.

Two Sheep skins, cover 5 spunges.

Two yards, 8 inches of Flannel, ¾-wide, make 10 cylinders.

Diameter of the Shot, 1-10 smaller than the bore of the piece.

Length of the Worm is the length of the spunger.

Do. of the Ladle is the length of the rammer.

Half an ounce of Thread make 30 cylinders.

Diameter of a stand of Grape, is the diameter of the shot, weight, 12lbs.

One yard, 8 inches of Canvas, covers 6 stand of grape.

One ounce of Marline quilts 1 stand of grape.

Half an ounce of Marline for seizing.

Quarter of an ounce of Twine for sewing a bag.

Diameter of the Bore is the length of the tompion.

The weight of a Flemish Wad is 18 ounces.

Twenty-two ounces of Junk to make 1 Wad, with wastage.

The diameter of a Grape-shot, 1 8-10 and 1-20, the wt. of do. 12 ozs.

Twelve Grape-shot make 1 stand.

The thickness of the Spunger-head, ¾ smaller than the bore.

EQUIPMENT OF LONG GUNS.

NINE POUND LONG GUN.

Handspike the length of the carriage.

Crow Bar the same.

Width of the Cylinder, 12 1-10 inches.

Length of do. 12 1-10 inches.

Gun tackle blocks, 8 inches.

Size of Rope for gun tackle falls, 2¼ inches.

Length of the do. Fall, 4 times the length of the gun.

Size of Rope for gun breechings, 5¾ inches.

Length of the Breechings, 3 times the length of the gun.

Thread-seizing for Breechings, 4-Thread.

Length do. 17 feet 4 inches, 7 and 6 turns.

Quarter-seizing for do. Housline, 14 feet 4 inches, 6 and 5 turns.

End-seizing for do. Marline, 11 feet 4 inches, 5 and 4 turns.

Seizing for Gun tackle blocks, Housline, length, 9 feet 8 inches.

Size of Straps for gun tackle blocks, 2¼ inches.

Length of Straps for the double blocks, 4 feet 3 inches.

Do. for the single blocks, 3 feet 9 inches.

2-Yarn Spun-yarn to serve the double block, 12 ozs.

Do. do. single Blocks, 8 ozs.

Length of the Rammer is the length from the breech ring to the face of the gun.

Length of the Rammer-head, 1¼ diameter of the bore.

Do. Spunger, 18 inches longer than the Rammer.

Do. Spunger-head, 1¼ diameter of the bore.

Two Sheep skins cover 5 spunges.

EQUIPMENT OF LONG GUNS.

One yard 33 inches of Flannel, ¾-wide, makes 10 cylinders.

Diameter of the Shot, 1-10 smaller than the bore.

Length of the Worm is the length of the spunger.

Do. Ladle is the length of the rammer.

Half an ounce of Thread make 30 cylinders.

Diameter of a stand of Grape is the diameter of the shot, weight, 9lbs.

One yard, 4 inches of Canvas, covers 6 stand of grape.

One ounce of Marline quilts 1 stand of grape.

Half an ounce of do. for seizing.

Quarter of an ounce of Twine to sew one bag.

Diameter of the Bore is the length of the tompion.

The weight of 1 Flemish Wad is 12 oz.

Fourteen ounces of Junk to make a Wad, with wastage.

Diameter of the Grape-shot, 1 6-10 and 1-20, weight of do. 9 ozs.

Twelve Grape-shot make 1 stand of grape.

The thickness of the Spunge-head, ¾ smaller than the bore of the piece.

All Stores expended allowed at the rate of 1 to every 50.

Ten Pump tacks to complete a cannister.

A Table of the Diameter for the Grape Shot.

42lb.	32lb.	24lb.	18lb.	12lb.	9lb.	6lb.
Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
2 & 7-10	2 4-10 and 1-20	2&3-10	2&1-10	1 8-10 and 1-20	1 6-10 and 1-20	1 4-10 and 1-20

EQUIPMENT OF CARRONADES.

Cylinder Formers for Long Guns.

32lb.		24lb.		18lb.		12lb.		9lb.		6lb.	
Length.	Width.	Length.	Width.	Length.	Width.	Length.	Width.	Length.	Width.	Length.	Width.
18½ inches.	17½ and 1-10 inches.	17 inches.	16 inches.	16 inches.	14½ and 3-10 inches.	15 inches.	14 and 3-10 inches.	12 and 7-10 inches.	12 and 1-10 inches.	11 inches.	10 and 3-10 inches.

A Table shewing the Weight of Grape Shot from 1 *to* 1000.

Wt. of 1	Wt. of 1	Wt. of 10	Wt. of 25	Wt. of 50	Wt. of 100	Wt. of 1000
lb.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.
42	2 4	22 8	56 4	112 8	225 0	2250 0
32	1 13	18 2	45 5	90 10	181 4	1812 8
24	1 8	15 0	37 8	75 0	150 0	1500 0
18	15½	9 11	24 3½	48 7	96 14	968 12
12	12	7 8	18 12	37 8	75 0	750 0
9	9	5 10	14 1	28 2	56 4	562 8

FORTY-TWO POUND CARRONADES.

Slide, one-half the length of the bed, or 1-3 of the bed.

Thickness, diameter of the bore.

Iron Rollers, thickness 1-3 diameter of the bore.

Train-bars, 2-3 length of the slide.

Length of the chamber of the Carronade is the diameter of the piece, if a true bore.

EQUIPMENT OF CARRONADES.

Length of the Cylinder, 12 inches and 7-10, width of do. 16 and 9-10 inches.

Size of Gun tackle blocks, 8 inches.

Size of Rope for gun tackle falls, 2¼ inches.

Length of the Fall, 4 times the length of the gun.

Size of Rope for breechings, 8 inches.

If the holes for the breechings are exact, 3 times the length of the gun is the length; if not, you must go by measurement.

Thread-seizing for breeching, 9-Thread, length 18 feet, 7 and 6 turns.

Quarter-seizing for do. 6-Thread, length 15 feet, 6 and 5 turns.

End-seizing for do. Housline, length 12 feet, 5 and 4 turns.

Preventer breechings, size, 5½ inches.

Seizing 4-Thread, length 17 feet 4 inches, 7 and 6 turns.

Seizing for gun tackle block straps, Housline, length, 9 feet 8 inches.

If required, Leather for the straps and breeching.

One Hide to each gun, and 1lb. of twine.

Size of Straps for gun tackle blocks, 2¾ inches.

Lenth for the double block strap, 4 feet 3 inches.

Do. for single do 4 feet.

2-Yarn Spun-yarn to serve double block straps, 12 ozs.

Do. do. Single, do. 8 ozs.

Length of the Rammer is the length from the breech ring to the face of the gun.

Length of the Rammer-head, 1¼ diameter of the bore.

EQUIPMENT OF CARRONADES.

Length of the Spunger, 12 inches longer than the rammer.

Do Spunger-head, 1 2-3 diameter of the bore.

Smallest part of the Spunge-head from the shoulder, once the diameter of the bore.

One Sheep skin covers 8 spunges.

Two yards, 26 inches of Flannel, ¾-wide, make 10 cylinders.

Diameter of the Shot, 1-10 smaller than the bore of the gun.

Length of the Worm is the length of the spunger.

Length of the Rammer is the length of the ladle.

Half an ounce of thread makes 34 cylinders.

Diameter of the Shot is the stand of grape, weight, 42lbs.

One yard, 10 inches American Canvas, 2 feet wide, makes 3 stand of grape.

One ounce of Marline quilts 1 stand of grape, ¼ an ounce of do. for seizing.

Quarter of an ounce of Twine for sewing a bag.

One and a quarter diameter of the bore is the length of the Tompion.

The Weight of a Flemish Wad is 3lbs.

Three pounds and 6 ozs. make 1 Wad, with wastage.

Diameter of the Grape-shot, 2 inches 6-10 and 1-20, wt. of do. 2lb. 4 ozs.

Twelve rounds of Grape-shot make 1 stand of grape.

Thickness of the Spunger-head, ⅛ smaller than the bore.

Slide, one-half the length of the bed, or one-third of the bed.

Thickness of the Slide, diameter of the bore.

EQUIPMENT OF CARRONADES

Thickness of Iron-rollers, 2-3 diameter of the bore.

Train-bars, 2-3 the length of the slide.

Length of the chamber of the Carronade is the diameter of the piece, if a true bore.

Length of the Cylinder, 12½ inches, width, 16 inches.

Size of Gun tackle blocks, 7 inches.

Size of Rope for tackle falls, 2½ inches.

Length of tackle falls, 4 times the length of the gun.

Size of Rope for breeching, 7½ inches.

If the holes in the sides of the Ship for breeching are exact, 3 times the length of the gun; if not, you must go by measurement.

Thread-seizing for breeching, 9-Thread, length, 17 feet 10 inches, 7 and 6 turns.

Quarter-seizing, for do. 6-Thread, do. 14 feet 10 inches, 6 and 5 turns.

End-sizing, for do. Housline, do. 11 feet 10 inches, 5 and 6 turns.

Seizing for Tackle block straps, Marline, length 9 feet 8 inches.

Preventer breechings, 5 inches.

Seizing for the same, 4-Thread, length, 17 feet 4 inches, 7 and 6 turns.

If Leather is required for the straps and breeching, 1 hide to each gun and 1lb. of twine.

Size of Rope for gun tackle block straps, 2½ inches.

Length of the double block straps, 38 inches.

Do. of the single do. 34 inches.

2-Yarn Spun-yarn to serve double block straps, 12 ozs.

Do. do. single do. 8 ozs.

EQUIPMENT OF CARRONADES.

Length of the Rammer is the length from the breech ring to the face of the gun.

Length of the Rammer-head, 1¼ diameter of the bore.

Do. of the Spunger, 12 inches longer than the rammer.

Do. of the do. head, 1 2-3 diameter of the bore.

Smallest part the spunge head from the shoulder once the diameter of the bore.

One Sheep skin covers 2 spunges.

Two and a quarter yards of Flannel, ¾-wide, makes 10 cylinders.

Diameter of the Shot, 1-10 smaller than the bore.

Length of the Worm is the length of the spunger.

Do. of the Rammer do. of the ladle.

Half an ounce of Thread makes 34 cylinders.

Diameter of the Shot is the stand of grape, weight, 32lb.

Forty inches American Canvas, 2 feet wide, makes 3 stand of grape bags.

One ounce of Marline quilts 1 stand of grape, half an ounce of do. for seizing.

Quarter of an ounce of Twine for sewing the bag.

One and a quarter diameter of the bore is the length of the Tompion.

The weight of 1 Flemish Wad is 34 ozs.

Forty ounces of Junk makes 1 Wad, with wastage.

Diameter of the Grape-shot, 2 inches 4-10 and 1-20, weight of do. 29 ozs.

Twelve round Grape-shot make 1 stand of grape.

Thickness of the Spunge-head, ¾ smaller than the bore.

EQUIPMENT OF CARRONADES.

TWENTY-FOUR POUND CARRONADES.

Slide, one-half the length of the bed, or 1-3 of the bed.

Thickness of the same, diameter of the bore.

Do. of Iron Roller, 1-3 diameter of the bore.

Train-bars, 2-3 the length of the slide.

Length of the chamber of the Carronades is the diameter of the piece, if a true bore.

Length of the Cylinder, 11 9-10 inches, width, 14 9-10 inches.

Size of the Gun tackle blocks, 6 inches, both single.

Size of Rope for tackle falls, 2 inches.

Length of the Tackle-falls, 3 times the length of the gun.

Size of Rope for breeching, 6½ inches.

Length of the Breeching, 3 times the length of the gun if the holes in the sides are exact; if not, you must go by measurement.

Thread-seizing for breeching, 4-Thread, length 17 feet 4 inches, 7 and 6 turns.

Quarter-seizing for do. Housline, length 14 feet 4 inches, 6 and 5 turns.

End-seizing, for do. Marline, 11 feet 4 inches, 5 and 6 turns.

Seizing for Tackle block straps, Marline, length, 9 feet 8 inches.

Preventer-breeching, 4 inches, seizing, 4-Thread, length, 17 feet 4 inches, 7 and 6 turns.

If Leather is required for the straps and breeching, 2 hides to every 3 guns, and 1lb. of Twine for the same.

Size of Tackle block straps, 2 inches.

Length of do. 27½ inches each.

EQUIPMENT OF CARRONADES.

2-Yarn Spun-yarn to serve both straps, 1lb. on one side.

Length of the Rammer is the length from the breech ring to the face of the gun.

Length of the Rammer-head, 1¼ diameter of the bore.

Do. of the Spunger, 12 inches longer than the rammer.

Do. of the Spunge-head, 1 1-3 diameter of the bore.

Smallest part of the Spunge-head from the shoulder once the diameter of the bore.

Two Sheep skins cover 5 Spunges.

Two yards 15 inches of Flannel, ¾-wide, make 10 cylinders.

Diameter of the Shot, 1-10 smaller than the bore of the piece.

Length of the Worm is the length of the spunger.

Do. of the Rammer is the length of the ladle.

Half an ounce of Thread makes 34 cylinders.

Diameter of the Shot is the stand of grape, weight, 24lbs.

Thirty-four inches American Canvas, 2 feet wide, makes 4 bags.

One ounce of Marline quilts 1 stand of Grape, half an ounce of do. for seizing.

Quarter of an ounce of Twine to make the bag.

One and a quarter diameter of the bore is the length of the tompion.

The weight of a Flemish Wad is 28 ozs.

Thirty-three ounces of Junk to make 1 Wad, with wastage.

Diameter of the Grape-shot, 2 and 3-10 inches.

Weight of the Grape-shot, 24 ounces.

Twelve round Grape-shot make 1 stand of grape.

The thickness of the Spunger-head, ¾ smaller than the bore.

EQUIPMENT OF CARRONADES.

EIGHTEEN POUND CARRONADES.

Slide one half the length of the bed, or 1-3 of the bed.

Thickness of the same, diameter of the bore.

Do of Iron-rollers, 2-3 diameter of the bore.

Train bars, 2-3 length of the slide.

Length of the chamber of the Carronade is the diameter of the piece, if a true bore.

Length of the Cylinder, 9½ inches, width, 12 inches and 9-10.

Size of Tackle-blocks, 6 inches.

Length of the Fall, 3 times the length of the gun.

Size of Rope for breeching, 5 inches.

If the holes in the side of the Ship for the breeching are exact, 3 times the length of the piece is the length; if not, you must go by measurement.

Thread-seizing for breeching, 4-Thread, length, 17 feet 4 inches, 7 and 6 turns.

Quarter-seizing for do. Housline, 17 feet, 6 and and 5 turns.

End-seizing for do. Marline, 10 feet 4 inches, 5 and 4 turns.

Seizing for tackle blocks, Marline, length, 9 feet 8 inches.

Preventer breechings, 4 inch seizing, 4-Thread, 17 feet, 7 and 6 turns.

If Leather is required for straps and breeching, half a hide to each gun.

Size of the Tackle block straps, 2 inches.

Length of the Block straps 27½ inches for each.

2-Yarn Spun-yarn to serve the block straps, 8 ozs. each.

EQUIPMENT OF CARRONADES.

Length of the Rammer is the length from the breech ring to the face of the gun.

Length of the Rammer-head, 1¼ diameter of the bore.

Do. of the Spunger, 12 inches longer than the rammer.

Do. of the Spunge-head, 1 2-3 diameter of the bore.

Smallest part of the Spunge-head from the shoulder, once the diameter of the bore.

Two Sheep skins cover 5 spunges.

One yard, 14 inches of Flannel, ¾-wide, make 9 cylinders.

Diameter of the Shot, 1-10 smaller than the bore of the gun.

Length of the Worm is the length of the spunger.

Do. of the Rammer is the length of the ladle.

Half an ounce of Thread makes 34 cylinders.

Diameter of the Shot is the stand of grape, weight 18lb.

Thirty-four inches of American Canvas, 2 feet wide, make 4 stand of grape.

One ounce of Marline quilts 1 stand of grape, half an ounce of do. for seizing.

Quarter of an ounce of Twine for sewing 1 bag.

One and a quarter diameter the bore is the length of the tompion.

The weight of a Flemish Wad is 23 ozs.

Twenty-seven ounces of Junk make 1 Wad, with wastage.

Diameter of the Grape-shot, 2 1-10 inches, weight of do. 15½ ozs.

Twelve round Grape make 1 stand of grape.

The thickness of the Spunge-head, ⅛ smaller than the bore.

EQUIPMENT OF CARRONADES.

TWELVE POUND CARRONADES.

Slide, one-half the length of the bed, or 1-3 of the bed.

Thickness of the same, diameter of the bore.

Thickness of Iron-rollers, 2-3 diameter of the bore.

Train-bars, 2-3 length of the slide.

Length of the chamber of the Carronade is the diameter of the piece, if a true bore.

Length of the Cylinder, 9 7-10, width, 10 2-10.

Size of Gun tackle blocks, 6 inches, both single.

Do. of Rope for tackle falls, 2 inches.

Length of the Fall, 3 times the length of the gun.

Size of Rope for the breeching, 5 inches.

If the holes in the Ship's side for the breeching are exact, 3 times the length of the gun is the length of the breeching; if not, you must go by measurement.

Thread-seizing for the breeching, 4-Thread, length, 17 feet 4 inches, 7 and 6 turns.

Quarter-seizing for do. Housline, 17 feet 4 inches, 6 and 5 turns.

End seizing, for do. Marline, 10 feet 4 inches, 5 and 4 turns.

Seizing for the tackle block straps, Marline, length, 9 feet 8 inches.

Preventer breeching, 3½ inches, seizing for do. Marline, length, 10 feet 6 inches.

If Leather is required for straps and breeching, half a hide to each gun, and 1lb. of Twine for the same.

Size of the tackle block Straps, 2 inches.

Length of the Straps, 27½ inches, both single.

2-Yarn Spun-yarn to serve block straps, 8 ozs. each.

EQUIPMENT OF CARRONADES.

Length of the Rammer is the length from the breech ring to the face of the gun.

Length of the Rammer-head, 1¼ diameter of the bore.

Do. of the Spunger 12 inches longer than the rammer.

Do. of the Sunger-head, 1 2-3 diameter of the bore.

Smallest part of the Spunge-head from the shoulder, once the diameter of the bore.

Two Sheep skins cover 5 spunges.

One yard 12 inches of Flannel, ¾-wide, makes 10 cylinders.

Diameter of the Shot, 1-10 smaller than the bore of the gun.

Length of the Worm is the length of the spunger.

Do. of the Rammer is the length of the ladle.

Half an ounce of Thread makes 34 cylinders.

Diameter of the shot is the stand of Grape, wt. 12lb.

One yard 8 inches American Canvas, covers 6 stand of grape.

One ounce of Marline quilts 1 stand of grape, half an ounce of do. for seizing.

Quarter of an ounce of Twine for sewing the bag.

One and a quarter diameter of the bore is the length of the tompion.

The width of a Flemish Wad, 18 ozs.

Twenty-two ounces of Junk make 1 Wad, with wastage.

Diameter of the Grape-shot, 1 3-10, weight, 12 ozs.

Twelve round Grape make 1 stand of grape.

Thickness of the Spunge-head, ⅛ smaller than the bore.

Twenty-five Pump tacks to cover 1 Spunge, from a 32lb. long gun to a 12lb. carronade.

EQUIPMENT OF CARRONADES

All rammers should have a shoulder ¼ less diameter the bore, which would be convenient to ram home the reduced cylinder to the chamber.

All seizings being mentioned for one side.—For one end of the breeching as for one block.

Cylinder Formers for Carronades.

42lb.		32lb.		24lb.		18lb.		12lb.	
Length.	Width.	Length.	Width.	Length.	Width.	Length.	Width.	Length.	Width.
12 and 7-10 inches.	16 and 9-10 inches.	12½ inches.	16 inches.	11 and 9-10 inches.	14 and 9-20 inches.	9½ inches.	12 and 7-10 inches.	9 and 7-10 inches.	10 and 2-10 inches.

QUESTIONS AND ANSWERS

Question.—Why is the single former ¼ of an inch less than the double former in the width ?

Answer.—On account of the flannel cutting to disadvantage, which will be rectified by putting the single former under the double former, which will cause two seams in making the single, and will save flannel.

Question.—How do you cut out cylinder formers for the carrronades ?

Answer.—Take 1 and 2-3 diameter of the bore, which is the length of the former, take 3 times the diameter of the bore of the chamber, ¼ less than that is the width.

Question.—How do you cut flannel cylinders to advantage ?

Answer.—Take a plain smooth table, a sharp shoemakers' knife, take the flannel with the two ends together, lay it smooth on the table, place the double formers close by the selvage, the head of the former being placed length ways with the flannel, on account of the warp stretching less than the filling; put two stand of grape on the former to make it firm, take the knife and be careful in cutting close as possible to the former, but not to damage it; take the double cylinder former (carronade) and place it underneath the long double former, if the flannel will allow your cutting them both; but if not, the long single cylinder former, and place it the contrary way with the double one, and that will cut 3 cylinders, one of which having two seams.

Question.—How do you preserve flannel and cylinders from being moheaten on board ?

Answer.—Take 1 oz. of white or yellow arsenic to 10lbs. of pounded pepper, drying the flannel and cylinders well first; take 50 cylinders in a bundle, and by putting a little

of the above mixture between each of them, and between the layings of the flannel, it will effectually secure them from moth and rats, by putting them in a dry place. How to preserve them on shore: take a cask that has had spirituous liquors in it, pack them up in it and head it up safe. It is requisite to allow 1 yard to every 50 yards of flannel for wastage, if it is not cut to advantage.

Question.—What will you do first towards examining or preparing a piece of ordnance?

Answer.—Scale or blow it with a small quantity of powder.

Question.—What will you do if it should be cracked?

Answer.—I will lay it up as free as possible and ring it with a hammer; if I suspect its being cracked, I will smoke it.

Question.—How will you find whether a gun be more on one side than the other?

Answer.—I will provide a staff square 1½ inch in diameter, about a foot longer than the bore of the piece, on one end fix a rammer-head, just to fit the bigness of the chamber, on the other end of the staff I will fix a traversing rammer-head, the hole of which must be 1-20 of an inch larger than the diameter of the staff; I then strike a line exactly in the centre of the staff, also a line in the centre of each rammer-head, which must correspond with that line on the staff; then put the staff with the fixed rammer-head and the line upwards into the bottom of the chamber; then the traversing rammer-head even with the muzzle of the piece; then with a straight sharp pointed wire, prick down at the vent on the fixed rammer-head, and if the mark comes on the line, it is truly bored.

QUESTIONS AND ANSWERS

Question.—How will you find whether a piece of ordnance be bored more on one side than the other; or more towards the upper or lower part of the piece?

Answer.—I will take a pair of callipers and take the diameter of the piece at the vent on the line A, B, C and D; I will then take a straight wire, and put it down the vent to the lower part of the cylinder, and make a mark on it close on the touch hole, so that the distance from the end of the wire which went to the bottom of the cylinder to the mark, lay on the same diameter as from A to C; then with a hooked wire, I will take the thickness of the metal at the vent and lay it down on the same dimension, with the same end as before, as from A to D; then if the distance A D, be equal to the distance C B, there is the same thickness of metal below as above: but if A D be greater than C B, there will be more of the metal below—and the contrary, if C B be greater than A D.

Question.—How do you find out if a gun be honey-combed?

Answer—I may see by reflecting the bore in a looking glass; or by the light of a candle put on a stick, if the gun be of a pretty large calibre:—but as the honey-comb by either of these methods cannot be seen properly if it be in or near the charge, it may be better found by providing a searcher with 5 prongs, hooked at the end, and put it into the gun quite home to the end of the bore, draw up the reliever which will expand the searcher, then draw it up and down gently, in a kind of spherical way, and if there be any honey-comb, one of the prongs will ply up in the hole; then make a mark on the staff, close to the muzzle, loose the searcher, draw it out of the gun, bringing the mark on the staff even with the same of the piece, and

USEFUL IN GUNNERY.

it will show in what part of the chamber the honey-comb is.

Question.—How do you find where the spot is?

Answer.—Take the single prong searcher, having a straight line along the staff, even with the hook, and from the hook lay off the distance marked on the first searcher, then put it in the gun until you have found the honey-comb, which will vent out nearly where the honey-comb is.

Question.—How do you find out of what depth the honey-comb is?

Answer.—Take another staff, having a spunge-head at the end with nearly one-half cut away, at the corner part of the spunge-head put a quantity of stiff putty, well chalked at the top, it will stick in the honey-comb; having marked as before the distance, press the putty in the hole, and it will bring out the impression of the hole.

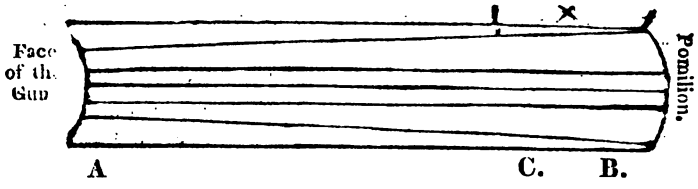
Question.—How deep must the honey-comb be to render the gun unfit for service?

Answer.—If the honey-comb be on either side of the lower metal, between the base ring and first ring, or ring 3-10 of an inch, it condemns her; if on the upper metal 1-10, if any part without the 2d circumference rings, it condemns her.

Question.—How do you find the height of the dispart of a piece of ordnance?

Answer.—If a gun be unloaded you may put a piece of wire down the touch-hole to the lower part of the cylinder, and make a mark on it even with a sight on the base ring, then take the wire and rest on the lower part the bore of the muzzle and the sight of the dispart above the muzzle ring; but a better way to find the dispart, and the method you must use, is as follows:—take the diameter of the base ring and lay

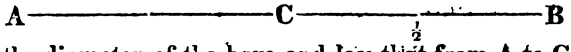
it on as from A to B, then take the diameter of the muzzle ring and set it on the same as from A to C;



then take half the depth of the two diameters, that is half the distance C B, is the height of the dispart; but if the gun is not truly bored, viz. if it has more metal at the top, the dispart must be so much longer than the other; or contrary, if leading from the sight on the base ring to the top of the dispart, it must always be parallel with the bore.

Question.—How do you find the thickness or fortification of any part of a piece of ordnance?

Answer.—I take with a pair of callipers the diameter of the piece when I would know the thickness of the metal, and lay it on a line as before;



take the diameter of the bore and lay that from A to C, half the length of C B is the thickness at place. A piece of ordnance, truly fortified, will measure as follows: viz. 11 times diameter the bore is the circumference of the piece breech ring; 9 times diameter of the bore is the circumference of the ring force ring; 7 times diameter of the bore is the circumference of the field force ring.

Touch-hole. Trunnions. Neck.

BRASS ORDNANCE.

Nine times diameter of the piece is the circumference of the breech ring.

USEFUL IN GUNNERY.

Seven times diameter of the piece is the circumference of the force ring.

Five times diameter of the piece is the circumference of the muzzle ring.

Touch-hole. Trunnions. Neck.

A piece of ordnance truly fortified (iron,) measures 7 feet diameter of the piece at the vent; viz. 3 feet from the base ring to the centre of the trunnion at the muzzle.

Question.—How do you adjust a shot to a cannon?

Answer.—I allow the shot to be 1-10 less of the diameter the bore, and 1-10 for the windage of the shot.

Question—What proportion of powder do you allow to each piece of ordnance?

Answer.—For all long guns 1-3 wt. of the shot, grenade 1-8 of the shot, carronades 1-12, and howitz 1-32 of the shot.

Question.—How many men are necessary to attend a piece of ordnance in time of service?

Answer.—Every man is supposed to work 500 cwt. carriage guns, 450 slides.

Question.—How do you know whether a gun is properly placed in the carriage, and whether the carriage fits the gun?

Answer.—A gun sets right in the carriage when you can see some distance between the gun and carriage at the trunnions, on one side as far as the other, and the gun comes even with the train of the carriage and measures 7-8 of length of the bore of the gun.

Question.—How do you charge a gun?

Answer.—Put the cartridge in the bottom first and ram down, except you find your gun bored too far behind the touch-hole, which you may suspect by its recoiling too violently, then it is best to put the top first.

Question.—Suppose the shot is too large, or in drawing the gun with a ladle be jammed in the vacant cylinder?

Answer.—First lay the gun as high as you can, and by jogging the gun make the shot roll out; but if it does not, prick down the charge well and drown the powder.

Question.—How would you get a piece of a broken bit out of the vent?

Answer.—Draw the gun then with a sharp pointed wire, scratch round the broken bit to loosen the powder, then put a little priming, and if it does not blow out, you may try it again; but if you cannot get it out by this method, take some powder and lay a train from the end of the cylinder to the other and stop your tompion in by hand, after making a small hole at the bottom of it, then set fire to the train and it will blow it out.—Another method: take a pint of sharp wine vinegar, half an ounce of camphor, one drachm of aquafortis, boil it down to half a pint, apply it to the touch-hole, pour it in until the half pint is all expended; try again as above with the cylinder, if the vinegar do not loosen it and the powder blow it up.—There is another method: take a half round stick, five inches shorter than the bore of the piece, the round part to lay exactly to the lower part of the bore of the piece, cut a narrow gutter in the round part of the stick, not exceeding ¼ of an inch in depth, and ¼ of an inch in width, put a fuse in this gutter to reach from one end to the other; take a narrow strip of paper and paste it over the fuse to the stick, so as to confine the fuse;

let the stick be two inches outside of the muzzle of the piece, putting it in the bore; weigh a full charge of powder, put in a ladle, shove it in the bottom of the cylinder of the piece, turn the ladle and let the powder remain in the bottom of the cylinder of the piece; take a soft wad, put it in the gun so as to shove the powder into the bottom of the cylinder, ram it home well with five strokes; then take a high junk wad and ram it home with seven strokes; take a sod of two thicknesses, then a soft wad, ram it home well with five strokes; take such a quantity of portfires as to let you secure yourself from danger, and make it fast to the muzzle of the piece near the fuse:—this method will either blow it out or burst the gun. Another method—take the gun and lay it down on two blocks, the touch-hole downwards, build a strong fire underneath near the breech of the piece, until you think the temper is taken from the steel in the vent, turn it over, let it cool and drill it out.

Question.—What will you do if a gun breaks loose at sea?

Answer.—I immediately cut down some of the hammocks and get such other like things to choak the gun and trip it if possible, and secure it with some good rope until the gale abates.

Question.—What will you do if a shot fetches away in a gun secured and in bad weather?

Answer.—In a line of battle ship, if a shot fetches away and the tompion is secured above the sill of the port, drown the powder with vinegar. The lower deck guns are never to be loaded on going to sea without express orders from the captain.

PARTS OF A GUN CARRIAGE.

1st, The rack—2nd, the stops—3rd, the transom—4th, the trucks—5th, the axle-trees——6th, the lynchpins—7th, the bolts and rings—8th, the beds and quoins—9th, the trunnion holes on the cheeks—10th, beds for the cap square.

In time of war it is requisite to have for each gun 35 rounds; viz. 15 rounds full charge, second charge 12, and third charge 8 rounds. In time of peace 15 rounds to each gun; viz. 8 first charge, 4 second charge, and 3 third charge.

DIMENSIONS OF BARRELS FOR POWDER.

Single barrels.	feet.	inches.
Depth, - - -	1	9½
Diameter at top, - -	1	3
Do. at the bilge, -	1	5
Do. at the bottom, -	1	3

Half Bbrrels.

Diameter at top, - -	1	3
Depth, - - -	1	2
Diameter at the bilge -	1	0
Do. at the bottom, -	1	0

FORM OF A CERTIFICATE.

This is to certify there remains on board the U. S. ship a sufficient quantity of empty barrels to contain powder on hand.—Given under my hand.

INSTRUCTIONS.

Remember before you go into a powder room to take particular care that your men who assist you have nothing about them that will strike fire. When you work in the powder room never face the light when you offer to strike the hoop in hooping or unhooping a barrel, least the mallet fly out of your hands towards the light. Be always the last out of the powder room, and see your lights out safe, and be sure to make your people get a swab and swab well in the passage way. If you have any suspicion of loose powder having gone through the palliatings of the magazine, you are to acquaint your captain of the same, so that when the ship goes into harbor to refit or be paid off, that the same palliatings may be taken down and cleared, to prevent any accident when in hands; and that the same may be carefully taken up by the carpenter of the dock yard, as accidents have happened by powder being concealed there. Always receive the keys yourself and return them yourself, (if well) from or to the commanding officer. The gunner's yeoman ought to know where all the stores are to be found, as it does not look well if a gunner deserts his quarters, under pretence of looking after any of his stores.

It has been found by experience that a proper allowance of powder to a 9lb. shot, flies it at the rate of 1650 feet in one second of time, or 1 mile in 4 seconds—the elevation 2 degrees. It is necessary to remark, that the barrels of gun-powder are made to contain more powder than the weight put in them: whole barrels will contain 100lbs. and half-barrels 50lbs. of powder; but of late only 90lbs. have been put in a barrel, and 45lb. in a half-barrel, which leaving the powder room to be shifted, preserves it the better.

PREPARATIONS FOR THROWING GUNS OVER BOARD IN BAD WEATHER.

In the first place you are to loose your tackle falls from the guns, and screw the carriage to the ship's side with the tackles; then cast loose the breeching, unreef it from the breeching rings and raise the guns with quoins on the edge, see the cutter parts in the side of the port have the forelocks ready to take out at a moments warning, in order to throw back the cap square; then with capstan bars at each end of the gun fixed under and between the fuze and reinforce rings, taking great care at the same time to heave up the gun very brisk with the roll of the ship, and the gun will go clear off the ship's side over board. As for the guns on the lower deck, take hold of the train tackle and hook the double block to the housing bolt, which is over the after sill of the port, take a short strap and put it over the pomillion of the gun, hook on your single block to that, the end of the fall, the reeve through the train bolt on deck, and haul it well taut; then take two side tackles and hook the double block where the single block was hooked, take the single block and hook it on the train ring bolt, and haul it well taut, which will keep the strain from the ship's side; take a half round chock which is to fit between the gun and the transom of the carriage, drive it in tight, then man your capstan bars and train tackle falls well; if the weather is bad and you have but few men, put a luff upon your train tackle falls: in the mean time, trip your capstan bars loose upon the train tackle falls, which will be the means of throwing your guns over board quicker—be careful to have a man placed at your port tackle falls, to let your port down as soon as the gun is out, to prevent the water rushing into the ship.

To know the distance of a shot on a ship by the sound of a gun, which is found to fly at the rate of 1142 *feet in one second of time, so that you may easily find the distance.*

EXAMPLE.

If seeing the flash of a gun and hearing the report, I count 9 seconds, there is the place from whence the gun was fired, 10,278 feet from me.

BY RULE.

1142 feet,
9 multiply.

Divide by 3 | 10,278

3,426 yards distance.

2,358 feet, one mile.
1,179 do. half a mile.

How to make a Gun lay fair on the Carriage, so as to keep clear of the Ports.

Place the gun on the carriage fair, then run her out to the port hole, take the coin from under her and let the breech of the gun rest on the bed, hook on your train tackles and run your gun in; if the upper part of the muzzle of the piece touches the upper part of the sill of the port, the bed of the carriage is not high enough; then run the gun out and put the quoin well in, depressing her as low as you can get her; if the lower part of the muzzle touches the lower part of the sill of the port, the transom of the carriage is cut too much, or the trucks too low, if the muzzle of the gun touches either the upper or lower sill of the port: there have been instances that it will either dismount the gun or disable the carriage—half an inch clear from each sill will be sufficient.

OBSERVATIONS AT QUARTERS.

Sec. 1st. When the drum beats to quarters you are then to keep silence, to see all the match tubs in the proper places, and the fire men with their fire buckets, gun locks and tube boxes. When the men are at the guns, then acquaint them that they are all loaded. The first thing in casting them off is to hook the train tackles and haul them taut and keep a turn with them.

Sec. 2nd. Cast off your crop and breast lashings, and haul your side tackles well taut and belay them, then cast off the seizings of the breechings, and let the clinch to the sideways, then middle the breechings in the thimble.

Sec. 3rd. Coil your tackle falls down clear and lay them close to the side of the ship clear of your feet, then place your spunge from getting wet.

Sec. 4th. Take out your hand crow, levers and crows, the crowlivers abaft the gun on the starboard side; in so doing, you will find it more convenient in taking out the quoins and beds, if required to elevate your piece.

Sec. 5th. Then cast off your muzzle lashings, train the gun with bed and quoin, take out your tompions and cast loose your guns.

Sec. 6th. Prime, but never confine the powder down the vent with the priming wire, but rather shake it from the powder as light as possible, if you make no use of quilt tubes.

Sec. 7th. Then man your side tackles and if working your lee-guns, case them with a turn to the ship's side, or you will start the shot from the wad, so that it cannot go with the velocity that may be expected.

Sec. 8th. In pointing your gun, the muzzle of the piece must not touch the ship's side, or side of the ports—leave

OBSERVATIONS AT QUARTERS.

always room of about two inches; look from the virtical sight the sight of the base ring to the sight on the muzzle ring, which is a true direction. If your gun takes the side when fired, abaft or before the port, and cause trouble to bring the gun square again—if you should meet with such a misfortune, take one of your side tackles and hook it to the breast-eye of the bolt of the next port, then you may bring the gun square again.

Sec. 9th. In securing your gun take out the quoins and lay the beds down from the axletree, then bowse your side tackles well taut and belay them, pass the muzzle lashings and keep the side tackles taut and fast till that is done, then get the clinch of your breechings back and seize it there; then pass your breast and upper cross lashings snug that both the breechings bear an equal strain with the side tackles, otherwise all the stress will lay on the ring bolt in the side.

Sec. 10th. In close action never put but one wad to two shot, round and grape or double head; or grape, round and case; but if at a great distance, round shot only, by reason you have more than six times the weight of powder, so that you are to consider if you charge with the round shot it cannot do much execution, and in discharging your gun four or five times it will rise the gun off the deck, throw out the quoins if not laid on square with the bed, or you perhaps hurt the men.

Sec. 11th. In warm action lay the bed down on quoins on one edge, it will answer more completely, as the gun will be on a true level, and more ready for elevation if required to direct a shot to the hull of the enemy's ship, from the quoins

under the gun; if for the mast and rigging, draw the quoin as may be found necessary; but particular attention must be observed of the rise and fall of the ship that you are on board of—if you fire when the ship is falling, the shot will go into the water.

Sect. 12th. At the recoiling of the gun stop the vent and keep it close, while the spunger spunges the gun at every four or five rounds—it will be necessary to worm the gun, for the oftener the gun is fired the powder leaves a dampness in the chamber, and the ramming home a paste cartridge it will remain there burning, as the dampness after the paste at the bottom of the cartridge causes it to stick fast.

Sec. 13th. Never keep the lee gun on a level while loading, by reason of your train tackle falls or hooks giving way, the man who is at the spunger and loading the gun, would be crushed to death between the breast of the gun-carriage and the ship's side. When loaded, raise your guns after priming them, but if they are not primed before you run them out, you may ship water, and fill the bore of the gun, and also get water on the priming.—On the lee-side it will be necessary to be as quick as possible to prevent the water from injuring the gun.

Sec. 14th. Should you meet with any accident to get the bore of your gun filled with water, and the priming wet, be then brisk and get the gun bore down and fit a tube in the vent, raise the metal with the bed and coin and fire as soon as you can—it is better to have a gun unloaded than to remain unserviceable.

ON POWDER.

Proportion of the different ingredients for making gunpowder by the different powers in Europe.

PROCESS:

	England.	France.	Sweden.	Poland.	Italy.	Russia.
Saltpetre.	75	75	75	80	76½	70
Sulphur.	10	9½	9	8	11	11½
Charcoal.	15	15½	16	12	12½	18½

TABLE OF THE DIFFERENT SORTS OF POWDER AND THE MARKS.

The different sorts of powder are distinguished by the following marks on the head of the barrels:—

No. 1. L. G. Cylinder,
No. 2. L. G. Cylinder,
No. 2. L. G. Cylinder,
S. A. the dust from No. 3. and F. G. Cylinder.
} marked in red.

4-7 Cylinder,
3-7 Cylinder,
} mixed, marked with L. G.

R. S. No. 2. L. E.
No. 3. F. G.
} marked in yellow, assorted.

I have heard that L. F. G. in S. G. denotes powder made of 2-7 cylinder charcoal, and is that which is always used first in the service.

ON POWDER.

To shew how Powder is tried in Great Britain.

Take an iron ball of 64lbs. from an 8 inch mortar, with a charge of 2 ozs. of the best cylinder powder, which generally gives about 180 feet range pit 150; but the weakest powder that can be produced has been tried only from 107 to 117 feet.

Method of proving Powder in the United States' Navy.

Fix a platform on a solid place to be perfectly level, take a 24lb. iron proocte and a 24lb. shot, to be no more than 1-20 windage, the vent hole to be no more than 1-10 of an inch diameter, the chamber to hold exactly one ounce of powder, then open your barrel in a place perfectly still, and where no wind can penetrate, shove your hand in the centre of the barrel, so as to take out a handful of the different grains of powder, weigh an ounce of the above handful of powder exactly, which is to be put in a small canister, made for that purpose, mark your canister and barrel the same, so as to be exact in the barrel you took it from, (having so many to open), put a wooden spile in the vent, lift the prooct perpendicular, take a long spout copper funnel, place the spout in the centre of the chamber, take your canister and pour your powder in the spout carefully, so as to let no wind blow the dust from it; shake your canister so as to let no powder remain in it; take out the spout and be careful to let every grain of powder and dust remain in it; take a piece of cartridge paper, large enough to cover the chamber, lower your prooct gradually down to its bed, so as to shake no powder out of the chamber; wipe your shot very clean and let no grease or sand remain on it; hook your shot and lower it as easy as possible in your prooct;

take your level and level the bed with plum; take your proving quadrant, put it on the bore of the piece and elevate it exactly to 45 degrees; take your distance line to be 310 yards, then from the prooct commence marking. Mark 50 yards from the prooct, and mark every 5 yards until you have marked the 310 yards, including the 50 yards; take a Thermometer, the Azimouth to be from 45 to 50 degrees, then take your spile out of the vent and prime it with very fine powder, then fire it off with a match; if the shot drops between any two sticks, then take your 5 foot rod and measure from the farthermost stick next to the shot; deduct that from the distance, and you can tell exactly the distance from the mouth of the prooct. Be careful to wash your prooct and wipe it dry every five fires, and your shot also every five fires—let the prooct prooct remain one hour so as to get cool. Be careful in not proving powder, without the wind is to the northward and the weather perfectly clear; instances have been known of powder loosing 20 yards by putting it to dry in a hot sun—latter end of spring and first part of the fall would be the best time.

Directions for Mealing Powder.

Take two pounds of corned powder, put it on a powder table and with a wooden roller bruise it as fine as possible, then put it in a double-headed sieve and sift it through, and what remains lay it on the table again and bruise it until the whole goes through.

Utensils wanted.

One powder table, 1 roller for mealing powder, 1 copper shovel, 1 handbrush, and 1 double bottomed sieve.

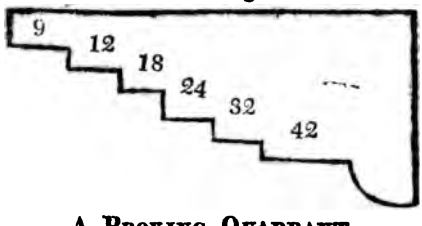
ON POWDER.

Proportion of Powder for Sea Guns, Long.

Poumders	Proof.		1st charge.		2nd charge.		3rd charge, or scaling.	
lbs.	lbs.	ozs.	lbs.	ozs.	lbs.	ozs.	lbs.	ozs.
42	25	0	14	0	12	4	10	8
32	21	0	10	8	9	4	8	0
24	18	0	8	0	7	0	6	0
18	15	0	6	0	5	4	4	8
12	12	0	4	0	3	8	3	0
9	9	0	3	0	2	10	2	4
6	6	0	2	0	1	12	1	8
4	4	0	1	5	1	2½	1	0
3	3	0	1	0	0	0	0	0
1½	0	8	0	3	0	0	0	0

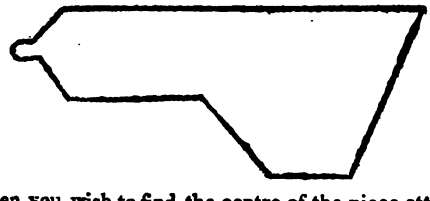
The foregoing table will be of use to gunners as the 2nd charge for saluting and 3rd for scaling, on account of the cylinders being filled and saving ammunition.

A GUNNER'S QUADRANT.



A PLUMB.

A PROVING QUADRANT.



When you wish to find the centre of the piece attach the plumb to the quadrant in the bore of the gun and you will find it.

The plumb must screw on the head of the quadrant on the centre line when you take an elevation, which will tell you quick when 45 degrees:

METHOD OF PROVING GUNS IN THE UNITED STATES' NAVY.

Sec. 1st. Lay your guns on the skeets level against a high bank, distance 10 yards, or twice the length of the gun; be careful not to have any rocks or stones before the bank or muzzle of the piece.

Sec. 2nd. Take a priming wire and put it in the touch hole.

Sec. 3rd. Take a reflecting glass and see whether the priming wire rests on the lower part.

Sec. 4th. The touch hole must not be drilled more than half an inch above the centre of the chamber, the drill must be 45 degrees elevation.

Sec. 5th. The chamber of a carronade must be the length of the diameter of the bore, and the chamber of a granade ought to be one and a half diameter of the bore.

Sec. 6th. Spunge your gun clean, then take your reflector and see whether there are any cracks or flaws in it.

Sec. 7th. Put the usual allowance of powder and a wad, ram it home with two men 9 times, then put in one round shot and a high junk wad, and ram it home 7 times; another round shot and a high junk wad, ram it home 7 times.

Sec. 8th. Prick and prime—after you prime blow the priming off even with the gun's touch hole, cut your portfires the length you want them, to give you time to secure yourself from any accident.

Sec. 9th. If there is or are any more guns than one you must cut your portfires in different lengths; the first one the longest, the last one the shortest, that they may go off regular and without any accident.

Sec. 10th. Put your portfires in the centre of your touch hole, then take some clay damped, and smooth it round the portfire and touch hole.

Sec. 11th. Prime your portfire with pulverized powder, be careful and fire the longest portfire first, and the shortest

last; take notice that the guns are 5 yards distance from each other, if there are guns any closer than 5 yards fire every other one.

Sec. 12th. After the guns are fired spunge them well with a half wet spunge; take the battle rammer and strike the gun three different times very hard, that you may hear the sound of the gun, so that you may know whether the gun is cracked or not.

Sec. 13th. Wet your guns inside and outside well, and wait until they are dry, then take your reflector and look inside and outside and see if there is any crack, the water will remain longer in those cracks than in any other part of the gun: you must take notice if there are any small specks that are wet, take a five prong searcher and search the wet spots in case there might be a flaw inside.

Question.—How would you mount your guns, nothing standing but the lower mast?

Answer.—I would take a fish davit or spar that would suit my purpose, rig it and reeve the purchase, and get my guns mounted by that means, which has been often tried.

Question.—How would you get the guns out of the hold, no mast standing?

Answer.—I get a spar and put it across the hatch of the spardeck, reeve the purchase in the centre of the spar perpendicular with the hold, sling the gun, lash the purchase on the slings, weigh the gun until you have brought it to the deck you want it on, then get a fore and aft tackle on and lodge it on the skeets if there is no carriage for it; bring it opposite the fish davit purchase, lash your davit purchase on, and by that means get them out of the ship without any difficulty.

A TABLE

Of days works calculated to finish the different articles appertaining to a Gun for actual service.

One day's work for one man to put 25 lanyards to 25 tompions.

One day's work for one man to put 25 beckets without cover to shot racks.

One day's work for one man to put beckets to 25 passing boxes.

One day's work for one man to put lanyards to 25 lead aprons.

One day's work for one man to put lanyards to 25 shot boxes.

One day's work for one man to put lanyards to 25 powder flasks.

One day's work for one man to put lanyards to 25 powder horns.

One day's work for one man to put lanyards to 25 mallet and spikes.

One day's work for one man to make 10 Flemish wads.

One day's work for one man to complete 15 stand of grape shot with painting.

One day's work for one man to complete 50 canisters with painting.

One day's work for one man to cover 10 spunge heads.

One day's work for one man to fix 25 cylinders filled complete.

One day's work for two men to fix 4 gun tackles compiets.

One day's work for one man to clinch 5 gun breechings.

One day's work for one man to make 3 muzzle bags complete.

CALCULATION OF A DAY'S WORK.

One day's work for one man to fix 25 quilt tubes with cartridges complete.

One day's work for one man to fix 25lbs. of match rope with priming complete.

One day's work for one man to make 50 musket and pistol ball cartridges complete, with packing.

One day's work for one man to make 100 blank cartridges with packing.

One day's work for one man to put lanyards to 50 fire-buckets.

One day's work for one man to fix 1 pouch barrel complete.

One day's work for one man to fix 4 sky rockets complete.

One day's work for one man to fix 4 portfires complete.

One day's work for one man to fix 12 blue lights complete.

One day's work for one man to fix 12 false fires complete.

One day's work for one man to hammer the rust off and black 100 round shot.

One day's work for one man to scrape and clean a gun complete in and outside.

One day's work for one man to paint a gun carriage and all complete.

It takes 37 days to complete one gun for actual service for one man.

A certain quantity of Junk taken to make a number of Flemish Wads.

Pounders.	Wt. of 10	Wt. of 21	Wt. of 50	Wt. of 100	Wt. of 1000
Pr.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.
42	33 12	84 6	168 12	337 8	3375 0
32	25 0	62 8	125 0	250 0	2500 0
24	20 10	51 9	103 2	206 4	2062 8
18	18 2	45 3	96 6	180 12	1807 8
12	14 12	36 14	73 12	147 8	1475 0
9	8 12	21 14	43 12	87 8	875 0

A quantity of Canvas taken to quilt a certain number of Grape.

Pounders.	Stand of grape 10	Stand of grape 25	Stand of grape 50	Stand of grape 100	Stand of grape 1000
Pr.	feet. inchs.	feet. inchs.	feet. inch.	feet. inchs.	feet. inchs.
42	12 10	32 1	64 2	128 4	1283 4
32	11 1	27 8½	55 5	110 10	1108 4
24	7 1	17 8½	35 5	70 10	708 4
18	6 11	17 3½	34 7	69 2	691 8
12	6 1 1-3	15 3 1-3	30 6 2-3	61 1 1-3	611 1 1-3
9	5 6 2-3	13 10 2-3	27 9 1-3	55 6 2-3	556 6 2-3

A quantity of Marline taken to quilt a certain number of Grape Shot.

Pounders.	Grape 10	Grape 25	Grape 50	Grape 100	Grape 1000
Pr.	ozs. drs.	ozs. drs.	ozs. drs.	ozs. drs.	ozs. drs.
42	15 0	37 8	75 0	150 0	1500 0
32	15 0	37 8	75 0	150 0	1500 0
24	15 0	37 8	75 0	150 0	1500 0
18	15 0	37 8	75 0	150 0	1500 0
12	15 0	37 8	75 0	150 0	1500 0
9	15 0	37 8	75 0	150 0	1500 0

A quantity of Twine taken to make a certain number of Bags.

Pounders.	Stand of grape 10	Stand of grape 25	Stand of grape 50	Stand of grape 100	Stand of grape 1000
Pr.	ozs. drs.	ozs. drs.	ozs. drs.	ozs. drs.	ozs. drs.
42	2 8	6 4	12 8	25 0	250 0
32	2 8	6 4	12 8	25 0	250 0
24	2 8	6 4	12 8	25 0	250 0
18	2 8	6 4	12 8	25 0	250 0
12	2 8	6 4	12 8	25 0	250 0
9	2 8	6 4	12 8	25 0	250 0

Weight of a certain number of Grape Shot.

Pounders.	Wt. of 10	Wt. of 25	Wt. of 50	Wt. of 100	Wt. of 1000
Pr.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.
42	22 8	56 4	112 8	225 0	2250 0
32	18 2	45 5	90 10	181 4	1812 4
24	15 0	37 8	75 0	150 0	1500 0
18	9 11	24 3½	48 7	96 14	968 12
12	7 8	18 12	37 8	75 0	750 0
9	5 10	14 1	28 2	56 4	562 4

This following table is very useful inasmuch as it gives you the weight of the different kinds of shot, as grape, canister, round and langrage.

Weight of a certain number of stands of Grape.

Pounders.	Wt. of 10	Wt. of 25	Wt. of 50	Wt. of 100	Wt. of 1000
Pr.	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.
42	420	1050	2109	4200	42,000
32	320	800	1600	3200	32,000
24	240	600	1200	2400	24,000
18	180	450	900	1800	18,000
12	120	300	600	1200	12,000
9	90	225	450	900	9,000

Weight of a certain number of double-headed Shot.

Pounders.	Wt. of 10	Wt. of 25	Wt. of 50	Wt. of 100	Wt. of 1000
Pr.	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.
42	500	1250	2500	5000	50,000
32	385	962½	1925	3850	38,500
24	290	725	1450	2900	29,000
18	215	537½	1075	2150	21,500
12	140	350	700	1400	14,500

Quantity of Thread taken to make a certain number of Cylinders for Carronades.

Pounders.	Cylinders for 10	Cylinders for 25	Cylinders for 50	Cylinders for 100	Cylinders for 1000
Pr.	ozs. drs.	ozs. drs.	ozs. drs.	ozs. drs.	ozs. drs.
42	0 2 6-17	0 5 15-17	0 11 14-17	1 7 11-17	16 4 9-17
32	0 2 6-17	0 5 15-17	0 11 14-17	1 7 11-17	16 4 9-17
24	0 2 6-17	0 5 15-17	0 11 14-17	1 7 11-17	16 4 9-17
18	0 2 6-17	0 5 15-17	0 11 14-17	1 7 11-17	16 4 9-17
12	0 2 6-17	0 5 15-17	0 11 14-17	1 7 11-17	16 4 9-17

Proportion of Powder for Carronades.

Pounders.	Proof.	1st Charge.	2nd Charge, or salute.	3rd Charge, or scaling.
Pr.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.
68	11 8	5 8	4 14	4 4
42	9 0	3 6	3 0	2 10
32	8 0	2 8	2 4	2 0
24	6 0	2 0	1 10	1 8
18	4 0	1 8	1 4	1 2
12	2 0	1 0	0 13 5-7	0 12

All carronades for sea service must be the 1st charge 1-12 the weight of the shot—2nd 1-14, and 3rd 1-16. Grenades 1st charge 1-8 the weight of the shot—2nd 1-10, and 3rd 1-12. Howitzer 1-32 the weight of the shot.

Quantity of Flannel taken to make a certain number of Cylinders for Long Guns.

Pounders.	Cylinders for 10	Cylinders for 25	Cylinders for 50	Cylinders for 100	Cylinders for 1000
Pr.	feet. inch.	feet. inch.	feet. inch.	feet. inch.	feet. inch.
32	11 1 1-3	27 9 1-3	55 6 2-3	111 1 1-3	1111 1 1-3
24	8 7	21 5½	42 11	85 10	858 4
18	6 11	17 3½	34 7	69 2	691 8
12	6 8	16 8	33 0	66 0	660 0
9	5 9	14 4½	28 9	57 6	575 0

Quantity of Thread taken to make a certain number of Cylinders for Long Guns.

Pounders.	Cylinders for 10	Cylinders for 25	Cylinders for 50	Cylinders for 100	Cylinders for 1000
Pr.	ozs. drs.	ozs. drs.	ozs. drs.	ozs. drs.	ozs. drs.
32	0 3	0 7½	0 15	1 14	18 12
24	0 3	0 7½	0 15	1 14	18 12
18	0 3	0 7½	0 15	1 14	18 12
12	0 3	0 7½	0 15	1 14	18 12
9	0 3	0 7½	0 15	1 14	18 12

Quantity of Flannel taken to make a certain number of Cylinders for Carronades.

Pounders.	Cylinders for 10	Cylinders for 25	Cylinders for 50	Cylinders for 100	Cylinders for 1000
Pr.	feet. inch.	feet. inch.	feet. inch.	feet. inch.	feet. inch.
42	8 2	20 5	40 10	81 8	816 8
32	7 6	18 9	37 6	75 0	750 0
24	7 3	18 1½	36 3	72 6	725 0
18	4 7 5-9	11 7	23 2	46 4	463 0
12	4 0	10 0	20 0	40 0	400 0

Quantity of Thread taken to make a certain number of Cylinders for Carronades.

Pounders.	Cylinders for 10	Cylinders for 25	Cylinders for 50	Cylinders for 100	Cylinders for 1000
Pr.	ozs. drs.	ozs. drs.	ozs. drs.	ozs. drs.	ozs. drs.
42	0 2 6-17	0 5 15-17	0 11 14-17	1 7 11-17	16 4 9-17
32	0 2 6-17	0 5 15-17	0 11 14-17	1 7 11-17	16 4 9-17
24	0 2 6-17	0 5 15-17	0 11 14-17	1 7 11-17	16 4 9-17
18	0 2 6-17	0 5 15-17	0 11 14-17	1 7 11-17	16 4 9-17
12	0 2 6-17	0 5 15-17	0 11 14-17	1 7 11-17	16 4 9-17

Proportion of Powder for Carronades.

Pounders.	Proof.	1st Charge.	2nd Charge, or salute.	3rd Charge, or scaling.
Pr.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs. ozs.
68	11 8	5 8	4 14	4 4
42	9 0	3 6	3 0	2 10
32	8 0	2 8	2 4	2 0
24	6 0	2 0	1 10	1 8
18	4 0	1 8	1 4	1 2
12	2 0	1 0	0 13 5-7	0 12

All carronades for sea service must be the 1st charge 1-12 the weight of the shot—2nd 1-14, and 3rd 1-16. Grenades 1st charge 1-8 the weight of the shot—2nd 1-10, and 3rd 1-12. Howitzer 1-32 the weight of the shot.

A Table shewing the Length and Weight of Guns used in the United States' Navy of true cast bores.

Pounders.	feet.	inches.	cwt.	qrs.	lbs.
Pr.					
32	9	6	53	3	20
24	9	4	48	0	0
18	9	0	41	1	8
12	9	0	32	3	0
	8	6	31	2	8
9	8	6	23	2	4
	8	0	22	0	12
6	7	0	17	1	14
	6	6	16	0	12
4	6	0	12	2	10

Diameter of the Bore of a piece of Ordnance.

42 Pr.	32 Pr.	24 Pr.	18 Pr.	12 Pr.	9 Pr.	6 Pr.
inches.	inches.	inches.	inches.	inches.	inches.	inches.
7 1-20	6 4-10	5 8-10	5 3-10 and 1-20	4 6-10	4 2-10	3 6-10 & 1-20

Diameter of the Round Shot.

42 Pr.	32 Pr.	24 Pr.	18Pr.	12 Pr.	9 Pr.	6 Pr.
inches.	inches.	inches.	inches.	inches.	inches.	inches.
6 8-10 and 1-20	6 3-10	5 7-10	5 2-10	4 5-10	4 1-10	3 4-10 & 1-20

All other shot to be the same diameter as the round shot.

The chamber of a 68 pounder to be the diameter of the bore of a 42 pounder.

The chamber of a 42 pounder to be the diameter of the bore of a 32 pounder.

The chamber of a 32 pounder to be the diameter of the bore of a 24 pounder.

The chamber of a 24 pounder to be the diameter of the bore of an 18 pounder.

The chamber of an 18 pounder to be the diameter of the bore of a 12 pounder.

The chamber of a 12 pounder some to be the diameter of the bore of a 9 pounder, and some of a 6 pounder.

A Table of a triangular Pile of Balls.

0	0	1	2	3	4	5	6	7	8	9
0	0	1	4	10	20	35	56	84	120	165
1	220	286	364	455	560	680	816	969	1140	1330
2	1555	1771	2024	2300	2600	2925	3276	3654	4060	4495
3	4960	5456	5984	6548	7140	7770	8436	9139	9880	10,660
4	11,480	12,341	13,244	14,190	15,180	16,215	17,296	18,424	19,600	20,825

Explanation of the foregoing Table.

The figures in the left hand column represent tens, those in the top line units—thus in a triangular table, requiring the number of balls in a triangular pile, the side of the base

row being 32, find 3 in the left hand column and 2 in the top line—and opposite 3 and below 2 is 5984, the number required.

EXAMPLE.

14
15 by multiply

210
by 16

Divide by 6 | 3360

560 Answer.

CALCULATOR OF BOMBS AND SHOT.

		Summit.	Total.			Summit.	Total.			Summit.	Total.
3 by	3	1	14	3 by	23	21	134	3 by	43	41	254
	4	2	20		24	22	140		44	42	260
	5	3	26		25	23	146		45	43	266
	6	4	32		26	24	152		46	44	272
	7	5	38		27	25	158		47	45	278
	8	6	44		28	26	164		48	46	284
	9	7	50		29	27	170		49	47	290
	10	8	56		30	28	176		50	48	296
	11	9	62		31	29	182				
	12	10	68		32	30	188				
	13	11	74		33	31	194	4 by	4	1	30
	14	12	80		34	32	200		5	2	40
	15	13	86		35	33	206		6	3	50
	16	14	92		36	34	212		7	4	60
	17	15	98		37	35	218		8	5	70
	18	16	104		38	36	224		9	6	80
	19	17	110		39	37	230		10	7	90
	20	18	116		40	38	236		11	8	100
	21	19	122		41	39	242		12	9	110
	22	20	128		42	40	248		13	10	120

The difference is 6 | The difference is 6 | The difference is 6 | The difference is 10

CALCUATOR OF BOMBS AND SHOT.

The difference is 10

	Summit.	Total.
4 by 14	11	130
15	12	140
16	13	150
17	14	160
18	15	170
19	16	180
20	17	190
21	18	200
22	19	210
23	20	220
24	21	230
25	22	240
26	23	250
27	24	260
28	25	270
29	26	280
30	27	290
31	28	300
32	29	310
33	30	320
34	31	330
35	32	340
36	33	350
37	34	360
38	35	370
39	36	380
40	37	390
41	38	400
42	39	410
43	40	420
44	41	430
45	42	440
46	43	450
47	44	460
48	45	470
49	46	480
50	47	490

The difference is 15

	Summit.	Total.
5 by 5	1	55
6	2	70
7	3	85
8	4	100
9	5	115
10	6	130
11	7	145
12	8	160
13	9	175
14	10	190
15	11	205
16	12	220
17	13	235
18	14	250
19	15	265
20	16	280
21	17	295
22	18	310
23	19	325
24	20	340
25	21	355
26	22	370
27	23	385
28	24	400
29	25	415
30	26	430
31	27	445
32	28	460
33	29	475
34	30	490
35	31	505
36	32	520
37	33	535
38	34	550
39	35	565
40	36	580
41	37	595

The difference is15

	Summit.	Total.
5 by 42	38	610
43	39	625
44	40	640
45	41	655
46	42	670
47	43	685
48	44	700
49	45	715
50	46	730

The difference is 21

	Sum.	Tot.
6 by 6	1	91
7	2	112
8	3	133
9	4	154
10	5	175
11	6	196
12	7	217
13	8	238
14	9	259
15	10	280
16	11	301
17	12	322
18	13	343
19	14	364
20	15	385
21	16	406
22	17	427
23	18	448
24	19	469
25	20	490
26	21	511
27	22	532
28	23	553
29	24	574
30	25	595

CALCULATOR OF BOMBS AND SHOT.

		Summit.	Total.
The difference is 21	6 by 31	26	616
	32	27	637
	33	28	658
	34	29	679
	35	30	700
	36	31	721
	37	32	742
	38	33	763
	39	34	784
	40	35	805
	41	36	826
	42	37	847
	43	38	868
	44	39	889
	45	40	910
	46	41	931
	47	42	952
	48	43	973
	49	44	994
	50	45	1015
	51	46	1036
	52	47	1057
	53	48	1078
	54	49	1099
	55	50	1120
	56	51	1141
	57	52	1162
	58	53	1183
	59	54	1204
	60	55	1225
	61	56	1246
	62	57	1267
	63	58	1288
	64	59	1309
	65	60	1330

		Summit.	Total.
The difference 21	6 by 66	61	1351
	67	62	1372
	68	63	1393
	69	64	1414
	70	65	1435

		Sum.	Tot.
The difference is 28	7 by 7	1	140
	8	2	168
	9	3	196
	10	4	224
	11	5	252
	12	6	280
	13	7	308
	14	8	336
	15	9	364
	16	10	392
	17	11	420
	18	12	448
	19	13	476
	20	14	504
	21	15	532
	22	16	560
	23	17	588
	24	18	616
	25	19	644
	26	20	672
	27	21	700
	28	22	728
	29	23	756
	30	24	784
	31	25	812
	32	26	840
	33	27	868
	34	28	896

		Summit.	Total.
The difference is 28	7 by 35	29	924
	36	30	952
	37	31	980
	38	32	1008
	39	33	1036
	40	34	1064
	41	35	1092
	42	36	1120
	43	37	1148
	44	38	1176
	45	39	1204
	46	40	1232
	47	41	1260
	48	42	1288
	49	43	1316
	50	44	1344
	51	45	1372
	52	46	1400
	53	47	1428
	54	48	1456
	55	49	1484
	56	50	1512
	57	51	1540
	58	52	1568
	59	53	1596
	60	54	1624
	61	55	1652
	62	56	1680
	63	57	1708
	64	58	1736
	65	59	1764
	66	60	1792
	67	61	1820
	68	62	1848
	69	63	1876
	70	64	1904

CALCULATOR OF BOMBS AND SHOT.

The difference is 36

8 by	Summit.	Total.
8	1	204
9	2	240
10	3	276
11	4	312
12	5	348
13	6	384
14	7	420
15	8	456
16	9	492
17	10	528
18	11	564
19	12	600
20	13	636
21	14	672
22	15	708
23	16	744
24	17	780
25	18	816
26	19	852
27	20	888
28	21	924
29	22	960
30	23	996
31	24	1032
32	25	1068
33	26	1104
34	27	1140
35	28	1176
36	29	1212
37	30	1248
38	31	1284
39	32	1320
40	33	1356
41	34	1392
42	35	1428
43	36	1464
44	37	1500
45	38	1536
46	39	1572

The difference is 36

8 by	Summit.	Total.
47	40	1608
48	41	1644
49	42	1680
50	43	1716
51	44	1752
52	45	1788
53	46	1824
54	47	1860
55	48	1896
56	49	1932
57	50	1968
58	51	2004
59	52	2040
60	53	2076
61	54	2112
62	55	2148
63	56	2184
64	57	2220
65	58	2256
66	59	2292
67	60	2328
68	61	2364
69	62	2400
70	63	2436

The difference is 45

9 by	Sum.	Tot.
9	1	285
10	2	330
11	3	375
12	4	420
13	5	465
14	6	510
15	7	555
16	8	600
17	9	645
18	10	690
19	11	735
20	12	780

The difference is 45

9 by	Summit.	Total.
21	13	825
22	14	870
23	15	915
24	16	960
25	17	1005
26	18	1050
27	19	1095
28	20	1140
29	21	1185
30	22	1230
31	23	1275
32	24	1320
33	25	1365
34	26	1410
35	27	1455
36	28	1500
37	29	1545
38	30	1590
39	31	1635
40	32	1680
41	33	1725
42	34	1770
43	35	1815
44	36	1860
45	37	1905
46	38	1950
47	39	1995
48	40	2040
49	41	2085
50	42	2130
51	43	2175
52	44	2220
53	45	2265
54	46	2310
55	47	2355
56	48	2400
57	49	2445
58	50	2490
59	51	2535

CALCULATOR OF BOMBS AND SHOT.

The difference is 45

9 by	Summit.	Total.
60	52	2580
61	53	2625
62	54	2150
63	55	2765
64	56	2760
65	57	2805
66	58	2850
67	59	2895
68	60	2940
69	61	2985
70	62	3030

The difference is 55

10by	Sum.	Tot.
10	1	385
11	2	440
12	3	495
13	4	550
14	5	605
15	6	660
16	7	715
17	8	770
18	9	825
19	10	880
20	11	935
21	12	990
22	13	1045
23	14	1100
24	15	1155
25	16	1210
26	17	1265
27	18	1320
28	19	1375
29	20	1430
30	21	1485
31	22	1540
32	23	1595
33	24	1650
34	25	1705
35	26	1760

The difference is 55

10by	Summit.	Total.
36	27	1815
37	28	1870
38	29	1925
39	30	1980
40	31	2035
41	32	2090
42	33	2145
43	34	2200
44	35	2255
45	36	2310
46	37	2365
47	38	2420
48	39	2475
49	40	2530
50	41	2585
51	42	2640
52	43	2695
53	44	2750
54	45	2805
55	46	2860
56	47	2915
57	48	2970
58	49	3025
59	50	3080
60	51	3135
61	52	3190
62	53	3245
63	54	3300
64	55	3355
65	56	3410
66	57	3465
67	58	3520
68	59	3575
69	60	3630
70	61	3685

The difference is 66

11by	Summit.	Total.
11	1	506
12	2	572
13	3	638
14	4	704
15	5	770
16	6	836
17	7	902
18	8	968
19	9	1034
20	10	1100
21	11	1166
22	12	1232
23	13	1298
24	14	1364
25	15	1430
26	16	1496
27	17	1562
28	18	1628
29	19	1694
30	20	1760
31	21	1826
32	22	1892
33	23	1958
34	24	2024
35	25	2090
36	26	2156
37	27	2222
38	28	2288
39	29	2354
40	30	2420
41	31	2486
42	32	2552
43	33	2618
44	34	2684
45	35	2750
46	36	2816
47	37	2882
48	38	2948
49	39	3014

CALCULATOR OF BOMBS AND SHOT.

The difference is 66

		Summit.	Total.
11by	50	40	3080
	51	41	3146
	52	42	3212
	53	43	3278
	54	44	3244
	55	45	3410
	56	46	3476
	57	47	3542
	58	48	3608
	59	49	3674
	60	50	3740
	61	51	3806
	62	52	3872
	63	53	3938
	64	54	4004
	65	55	4070
	66	56	4136
	67	57	4202
	68	58	4268
	69	59	4334
	70	60	4400

The difference is 78

		Sum.	Tot.
12by	12	1	650
	13	2	728
	14	3	806
	15	4	884
	16	5	962
	17	6	1040
	18	7	1118
	19	8	1196
	20	9	1274
	21	10	1352
	22	11	1508
	23	12	1586
	24	13	1664
	25	14	1742
	26	15	1820
	27	16	1898

The difference is 78

		Summit.	Total.
12by	28	17	1976
	29	18	2054
	30	19	2132
	31	20	2210
	32	21	2288
	33	22	2366
	34	23	2444
	35	24	2522
	36	25	2600
	37	26	2678
	38	27	2756
	39	28	2834
	40	29	2912
	41	30	2990
	42	31	3068
	43	32	3146
	44	33	3224
	45	34	3302
	46	35	3380
	47	36	3458
	48	37	3536
	49	38	3614
	50	39	3692
	51	40	3770
	52	41	3848
	53	42	3926
	54	43	4004
	55	44	4082
	56	45	4160
	57	46	4238
	58	47	4316
	59	48	4394
	60	49	4472
	61	50	4550
	62	51	4628
	63	52	4706
	64	53	4784
	65	54	4862
	66	55	4940

The dif. is 78

		Summit.	Total.
12by	67	56	5018
	68	57	5096
	69	58	5174
	70	59	5252

The difference is 91

		Sum.	Tot.
13by	13	1	819
	14	2	910
	15	3	1001
	16	4	1092
	17	5	1183
	18	6	1274
	19	7	1365
	20	8	1456
	21	9	1547
	22	10	1638
	23	11	1729
	24	12	1820
	25	13	1911
	26	14	2002
	27	15	2093
	28	16	2184
	29	17	2275
	30	18	2366
	31	19	2457
	32	20	2548
	33	21	2639
	34	22	2730
	35	23	2821
	36	24	2912
	37	25	3003
	38	26	3094
	39	27	3185
	40	28	3276
	41	29	3367
	42	30	3458
	43	31	3549
	44	32	3640
	45	33	3731

CALCULATOR OF BOMBS AND SHOT.

The difference is 91

	Summit.	Total.
13by46	34	3822
47	35	3913
48	36	4004
49	37	4095
50	38	4186
51	39	4277
52	40	4368
53	41	4459
54	42	4550
55	43	4641
—	—	—
57	45	4823
58	46	4914
59	47	5005
60	48	5096
61	49	5187
62	50	5278
63	51	5369
64	52	5460
65	53	5551
66	54	5642
67	55	5733
68	56	5824
69	57	5915
70	58	6006

The differ'e is 105

	Sum.	Tot.
14by14	1	1015
15	2	1120
16	3	1225
17	4	1330
18	5	1435
19	6	1540
20	7	1645
21	8	1750
22	9	1855

The difference is 105

	Summit.	Total.
14by23	10	1960
24	11	2065
25	12	2170
26	13	2275
27	14	2380
28	15	2485
29	16	2590
30	17	2695
31	18	2800
32	19	2905
33	20	3010
34	21	3115
35	22	3220
36	23	3325
37	24	3430
38	25	3535
39	26	3640
40	27	3745
41	28	3850
42	29	3955
43	30	4060
44	31	4165
45	32	4270
46	33	4375
47	34	4480
48	35	4585
49	36	4690
50	37	4795
51	38	4900
52	39	5005
53	40	5110
54	41	5215
55	42	5320
56	43	5425
57	44	5530
58	45	5635

The difference is 105

	Summit.	Total.
14by59	46	5740
60	47	5845
61	48	5950
62	49	6055
63	50	6160
64	51	6265
65	52	6370
66	53	6475
67	54	6580
68	55	6685
69	56	6790
70	57	6895

The difference is 120

	Sum.	Tot.
15by15	1	1240
16	2	1360
17	3	1480
18	4	1600
19	5	1720
20	6	1840
21	7	1960
22	8	2080
23	9	2200
24	10	2320
25	11	2440
26	12	2560
27	13	2680
28	14	2800
29	15	2920

Rule to find the Number of Bombs or Shot in a Pile.

Piles or pyramids of bombs or shot, so termed from the form they use to store them up in magazines. A general rule to calculate a complete square pile:—multiply the corner row by that row more one; multiply the product by twice the corner row more one and divide by six, and the product will be the answer.

EXAMPLE:

Required the number of balls in a square pile, the corner row 10?

10
Multiply 11

110
Multiply 21

Divide by 6 | 2310

385 Answer.

Rule for making Gun Carriages.

		32 Pounder.	24 Pounder.	18 Pounder.	12 Pounder.	9 Pounder.	6 Pounder.
		feet. inches.	feet. inches.	feet. inches.	feet. inches.	feet. inches.	feet. inches.
Width,	Fore part, - -	1 6	1 5	1 3	1 2	1 1	1 0
	After part, - -	2 2	1 11	1 9	1 7½	1 7	1 5
Length of the fore axletree		4 9	4 7	4 3	3 9½	3 6½	3 4
Body of the fore axletree,	Length,	3 0	2 11	2 9	2 6	2 3½	2 0¾
	Breadth,	0 6¾	0 6¾	0 6	0 5½	0 5½	0 5
	Width,	0 11¼	0 10	0 10	0 10	0 9½	0 9

RULE FOR MAKING GUN CARRIAGES.

	32 Pounder.	24 Pounder.	18 Pounder.	12 Pounder	9 Pounder.	6 Pounder.
	feet. inches.	feet. inches.	feet. inches.	feet. inches.	feet. inches.	feet. inches.
Arms of the fore axletree, Length,	0 10½	0 9¼	0 9 1-8	0 8	0 7½	0 7
Arms of the fore axletree, Diameter,	0 6 1-8	0 6 1-8	0 5¾	0 5 1-8	0 5 1-8	0 4½
Length of head axletree,	4 9	4 7	4 3	3 9½	3 6½	3 4
Body of the hind axletree, Length,	3 0	2 11	2 9	2 6	2 3½	2 0¾
Body of the hind axletree, Height,	0 6¾	0 6¾	0 6	0 5½	0 5 1-8	0 5
Body of the hind axletree, Breadth,	1 0	1 0	1 0	1 0	1 0	1 0
Fore trucks, Diameter,	1 7	1 6	1 6	1 4	1 4	1 2
Fore trucks, Thickness	0 6	0 5½	0 5	0 4½	0 4	0 3½
Hind trucks, Diameter,	1 4	1 4	1 3	1 2	1 2	1 0
Hind trucks, Thickness	0 6	0 5½	0 5	0 4½	0 4	0 3½
Side pieces, Height,	2 2	2 0	1 10	1 8	1 6	1 4
Side pieces, Length,	6 4	6 0	5 9	5 6	5 3	5 0
Side pieces, Breadth,	0 6	0 5½	0 5	0 4½	0 4	0 3½
Trunnion from the head,	0 8	0 8	0 8	0 6¾	0 6 7-8	0 6 5-8
Whole height from the body of the Trunnion,	2 9	2 7	2 6	2 3	2 1	2 6
	cwt. qrs.	cwt. qrs.	cwt. qrs.	cwt. qrs.	cwt. qrs.	cwt. qrs.
Weight of the carriage, bed and coins, - -	9 0	8 0	7 0	6 0	3 3	2 3

A TABLE ON FIRE SHIPS.

The chambers of a fire ship are 10 inches long and 3-5 the diameter of the length—fire barrels should not be less than 21 inches, and 30 inches is sufficient for the length. The reeds are made up in small bundles of about a foot in circumference, cut even at both ends and tied together in two places. They are in two kinds, viz. the long and the short; the former of which are 4 feet, and the latter 2 feet 5 inches.

Fire barrels, 8.	Curtains, 30.
Bavins, 200.	Portfires, 24.
Long reeds, 150.	Short reeds, 75.
Hand grenades, 60.	Short double dipt reeds, 75.

Chambers for the ports, 12.

This will answer for any fire ship.

TO COMPLETE A FIRE SHIP.

A Table of the Weights and number of Stores.

	No.	cwt.	qrs.	lbs.	ozs.
Fire barrels when empty, -	8	0	0	26	12
Fire barrels when filled, - -	0	3	2	16	0
Fuse composition, - - -	0	0	0	10	0
Cotton quick match, - -	0	0	0	5	0
A soaking for nail holes, - -	0	0	0	8	0
Cover for the barrels, - -	8	0	0	4	15
Long reeds, single dipt, -	150	0	0	4	11
Short reeds, single dipt, - -	100	0	0	4	1
Composition for barrels, for priming - - -	3½	0	0	0	0

	No.	cwt.	qrs.	lbs.	ozs.
Cotton quick match with thread, - -	0	0	2	4	0
Chambers for blowing open ports, -	14	0	0	0	0
Powder for filling the shells,	0	0	0	0	10
Elm ploughs, - -	14	0	0	0	0
Hand grenades for service,	60	0	0	3	11 each
Corned powder for filling shells, - -	0	0	0	0	3½
Fuse, drove, primed, caped and fixed, -	60	0	0	0	0
Mealed powder, -	0	0	0	10	0

The following method to be observed in placing the Stores and priming a Fire Ship.

The eight barrels to be placed—four under the four fire trunks, and the other four between them, two on each side of the fire scuttle. The largest reeds to be laid in the fore and aft troughs, and the shortest reeds the athwart troughs. The bavins which are made of birch, and like brooms dipt at one end, they are to be tied down over the reeds, and the curtains to be nailed to the bavins an equal distance and quantity on each side. The remainder of the reeds to be tied in a position nearly upright at the angles of every square, and then to be tied on. If any reed bavins be left, they are to be put round the fire barrels and other vacant places, and tied fast. You must have leaders of quick match round all the fire barrels and fire chest. You must take up all your reeds and bavins, and put a little composition upon all the upper parts of the reeds through the fire

room, and upon the same composition tie a double quick match, so as the fire may communicate to all the parts at once.

Composition to prime a Fire Ship.

	lbs.	ozs.		lbs.	ozs.
Saltpetere pulverized,	6	4	Powder rosin,	0	12
Fine sulphur, -	5	0	Mealed powder,	10	8

Linseed oil, half a pint.

Another Composition for priming a Fire Ship.

	lbs.	ozs.		lbs.	ozs.
Saltpetre pulverized,	22	8	Rosin, -	12	11
Sulphur, - -	18	0	Mealed powder,	45	0

Linseed oil, one pint.

Composition for making Quick Match.

	lbs.	ozs.		qts.	gills.
Cotton, -	1	12	Spirits of wine,	2	0
Saltpetre, -	1	8	Water, -	2	0
Mealed powder,	10	0	Isinglass, -	0	3

Method of Blowing a Ship or Fortification up.

Make a hose of 6 feet in length of canvas or bellows leather, one end of each hose must have a wooden tube with a screw, the other end to have a wooden tube with a worm, to make it any length you want it; when joined, to be well paid with black varnish, so as to make them water tight—

those hoses to be filled with portfire composition; after they are filled set fire to one of them, and by a watch, take particular notice to see how long it burns; then take a stick of portfire and measure it by rule, and set fire to it, so as to tell how many minutes or seconds it will burn of the same composition; then prime those wooden tubes with powder mixed with linseed oil; then bore a hole in the magazine scuttle the bigness of the hose; also the magazine doors; put your tube in one of the powder barrels filled; get some putty, so as to putty all round the holes in the doors, the length of the hose below the first scuttle of the magazine passage is not counted, on account there might be some loose powder in the passage and thereby go off before the time appointed; stop your hose up all along the beams and carlines; bore a hole through the ship's side the diameter of the hose, as high from the water as you wish it; the lower end of the hose from the ship put such a quantity of portfires as you wish:—sometimes ship's are set off from the bows, from the side and from the stern; the safest way is from the bows if you have time.

Composition for dipping Reeds, Bavins and Curtains.

	lbs.		lbs.
Rosin, - -	120	Coarse Sulphur,	90
Swedish Pitch, -	60	Tallow, -	6
Mealed Powder, -	12		

Composition for Blacking Guns.

	lbs.		lbs.
Black lead, -	20	Red lead, -	10
Lampblack, -	1½	Linseed oil, -	18 gals.

DIRECTIONS:

First the above mentioned articles must be ground very fine with boiled oil.

PROCESS.

Boil the oil sufficiently until every appearance of froth subsides—the best way is to have two iron pots, dividing the oil in each pot, put the black lead in the boiled oil, and boil it half an hour. The 10lbs. of red lead must be put in the other pot, after the oil is put on the fire and boiled half an hour; after which, put the lampblack to the red lead and boil them together half an hour.—The two pots must be put by until nearly cold, when by the means of an iron ladle the ingredients must be shifted from one pot to the other, until they are naturally well mixed.

CAUTION.

Great care must be taken during the time the liquor is preparing to prevent its boiling over, and in particular to keep stirring the ingredients during the time of boiling.

Composition for Blankets.

Coarse paper steeped in a solution of saltpetre, one pound to a gallon of water, which when dry are again steeped in a solution of tallow, 5lbs.; rosin, 5lbs.; and sulphur, 2lbs.—this composition is intended for a fire ship.

On Carcasses.

	lbs.		lbs.
Composition—Pitch,	200	Saltpetre, -	400
Sulphur,	100	Common powder	300

The pitch is melted in an earthen pot, and when the pot is taken off and the ingredients well mixed, are put in the

carcasses, and are then filled with as much as can be put and pressed in; they are then primed with another composition and pitched over until used.

COMPOSITION.

	lbs.		lbs.
Saltpetre, -	50	Sulphur, -	25
Antimony, -	5	Rosin, - -	8
Pitch, - -	5		

Valencia Composition for Shells to answer as Carcasses.

	lbs.		lbs.
Saltpetre, -	50	Sulphur, - -	28
Antimony, -	18	Rosin, or Swedish pitch,	6

This composition is cast in cylinder moulds, 5 inches long and of different diameters, according to the shell in which it is to be used; if it is put in with the bursting powder in pieces as large as the shell will admit, without bursting or preventing the fuse from being driven down.

Composition of Fuzes for Shells.

	lbs.	ozs.		lb.
Saltpetre, -	3	4	Sulphur, -	1
Mealed powder,	2	0	to mix with linseed oil.	

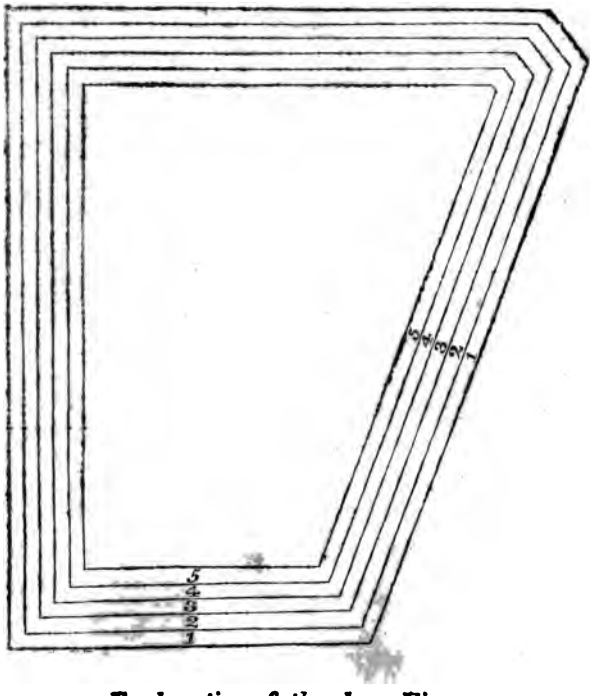
Size and Weight of Carcasses.

Species.	Size	Empty Weights.	Weight of Composition.	Weight complete.	Time each will burn
	Inch.	lbs. ozs. drs.	lbs. ozs. drs.	lbs. ozs. drs.	min. sec.
For Mortars and Howitzers, - -	13	170 10 11	18 14 0	189 8 11	11 0
	10	89 13 11	7 8 11	97 6 6	8 30
	8	44 9 5	4 4 11	48 14 0	5 30

SIZE AND WEIGHT OF CARCASSES.

Species.	Size.	Empty Weights.	Weight of Composition.	Weight complete.	Time each will burn.
	Inch.	lbs. ozs. drs.	lbs. ozs. drs.	lbs. ozs. drs.	min. sec.
Guns.	Pr. 42	27 3 0	2 7 11	29 10 11	5 0
	32	20 13 5	1 11 5	22 8 10	4 30
	24	14 12 0	1 9 11	16 5 11	4 0
	18	11 13 11	1 1 5	12 15 0	4 0
Carronades	42	26 0 0	2 7 0	28 7 0	4 30
	32	21 10 0	1 13 0	23 7 0	4 0
	24	14 5 0	4 5 0	16 10 0	3 30
	18	10 4 0	1 2 0	11 6 0	3 0

FORMERS FOR MUSQUET OR PISTOL CARTRIDGES.



Explanation of the above Figures.

No. 1. Musquet, 16 to the pound.
No. 2. Musquet, 20 to the pound.
No. 3. Pistol, 25 to the pound.
No. 4. Pistol, 32 to the pound.
No. 5 Tube Cartridges.

MUSQUET AND PISTOL CARTRIDGES.

A sheet of cartridge paper 21 by 18 inches makes 16 cartridges.

A sheet of cartridge paper, same length and width makes 24 pistol cartrides.

A sheet of cartridge paper packs up 48 cartridges.

Two and one-half drachms of thread makes 10 pistol or musquet cartrides.

Half an ounce of bees-wax makes 200 pistol or musquet cartridges.

Musquet, 16 to the pound, 6 drachms of powder.
Do. 20 to the pound, 5½ do. do.
Pistol, 25 to the pound, 4 drachms of powder.
Do. 32 to the pound, 3 do. do.
Tube cartrides, to the pound 3 do. do.

A Table shewing the number of Musquet and Pistol Cartridges made from one sheet to one and two quires of paper.

MUSQUET CARTRIDGES.

Cartridges.	Sheets.	Quires.
16	1	0
384	24	0
768	0	2

PISTOL CARTRIDGES.

Cartridges.	Sheets.	Quires.
24	1	0
576	24	0
1152	0	2

TABLES ON MUSQUET AND PISTOL CARTRIDGES.

A Table shewing the quantity of Powder taken for a number of Cartridges.

Cartridges.	Cartridges 10	Cartridges 25	Cartridges 50	Cartridges 100	Cartridges 1000
16 to the lb.	ozs. drs. 3 12	ozs. drs. 9 6	lbs. ozs. drs 1 2 12	lbs. ozs. drs 2 5 8	lbs. ozs. dr. 23 7 0

A Table shewing the quantity of Twine to pack a number of Cartridges.

12 to the pack.	Packs 10	Packs 25	Packs 50	Packs 100	Packs 1000
Musquet 16 to the lb. Cartridges.	lbs. ozs. 0 ½	lbs. ozs. 0 1¼	lbs. ozs. 0 2½	lbs. ozs. 0 5	lbs. ozs. 3 2
	120	300	600	1200	12,000

A Table shewing the weight of so many Packs of Cartridges.

Musquet.	Weight of 10	Weight of 25	Weight of 50	Weight of 100	Weight of 1000
16 to the lb.	lbs. ozs. 11 4½	lbs. ozs. 28 3¼	lbs. ozs. 56 6½	lbs. ozs. 112 13	lbs. ozs. 1128 2
	120	300	600	1200	12,000

TABLES ON MUSQUET AND PISTOL CARTRIDGES.

A Table shewing the quantity of Thread taken for a number of Cartridges.

Musquet.	Thread for 10	Thread for 25	Thread for 50	Thread for 100	Thread for 1000
16 to the lb.	ozs. drs. 0 2½	ozs. drs. 0 6¼	ozs. drs. 0 12½	ozs. drs. 1 9	ozs. drs. 15 20

A Table shewing the Weight of a number of Packs of Cartridges.

Musquet.	Weight of 10	Weight of 25	Weight of 50	Weight of 100	Weight of 1000
20 to the lb.	lbs. ozs. 9 6½	lbs. ozs. 23 8¼	lbs. ozs. 47 0½	lbs. ozs. 94 1	lbs. ozs. 940 10
12 to a pack.	120	300	600	1200	12,000

A Table shewing the quantity of Powder taken for a number of Cartridges.

Musquet	Cartridges 10	Cartridges 25	Cartridges 50	Cartridges 100	Cartridges 1000
20 to the lb.	lb.ozs.drs 0 3 7	lb.ozs.drs 0 8 9½	lb.ozs.drs 1 1 3	lb.ozs.drs 2 2 6	lb. ozs. drs 21 7 12

Twine, thread and paper for musquet cartridges take the same.

TABLES ON MUSQUET AND PISTOL CARTRIDGES.

A Table shewing the quantity of Powder taken for a number of Pistol Cartridges.

Pistols.	Cartridges 10	Cartridges 25	Cartridges 50	Cartridges 100	Cartridges 1000
25 to the lb.	ozs. drs. 2 8	ozs. drs. 6 4	ozs. drs. 12 8	lb.ozs.drs 1 9 0	lbs. ozs.drs 15 10 0

A Table shewing the weight of a certain number of packs of Pistol Cartridges.

Packs.	Weight of 10	Weight of 25	Weight of 50	Weight of 100	Weight of 1000
25 to the lb.	lbs. ozs. 6 0½	lbs. ozs. 15 1¼	lbs. ozs. 30 2½	lbs. ozs. 60 5	lbs. ozs. 603 2
Cartridges.	120	300	600	1200	12,000

A Table shewing the quantity of Powder taken for a number of Pistol Cartridges.

Pistols.	Cartridges 10	Cartridges 25	Cartridges 50	Cartridges 100	Cartridges 1000
32 to the lb.	ozs. drs. 1 14	ozs. drs. 4 11	ozs. drs. 9 6	lb.ozs.drs 1 2 12	lbs.ozs.drs 11 11 8

A Table shewing the weight of a certain number of Packs of Pistol Cartridges.

Pistols.	Weight of 10	Weight of 25	Weight of 50	Weight of 100	Weight of 1000
32 to the lb.	lbs. ozs. 5 13	lbs. ozs. 14 8½	lbs. ozs 29 1	lbs. ozs. 58 2	lbs. ozs. 581 4
Cartridges	120	300	600	1200	12,000

All cartridges take one quantity of thread and paper.

TABLES ON LONG GUNS AND CARRONADES.

A Table shewing how many Fathoms of Seizing stuff are taken for a number of breechings for long guns.

Breeching.	Throat seizing.				Quarter seizing.				End seizing.			
Size.	Fathoms 10				Fathoms 10				Fathoms 10			
Inches.	Fath.	feet.	inch.	size.	Fath.	feet.	inch.	size.	Fa.	feet.	in.	size.
8	30	0	0	9th.	25	0	0	6th.	20	0	0	H.
7½	29	4	4	9th.	24	4	4	6th.	19	4	4	H.
6½	29	1	0	6th.	24	1	0	4th.	19	1	0	H.
6	29	0	2	6th.	24	0	2	4th.	19	0	2	H.
5½	28	5	4	4th.	23	5	4	H.	18	5	4	M.

TABLES ON LONG GUNS AND CARRONADES.

A Table shewing how many Blocks are taken for a certain number of long guns.

Size of guns.	Size of blocks.	for 1 gun.	for 10 guns.	for 25 guns.	for 50 guns.
Pr.	Inches.				
32	12	6	60	150	300
24	11	6	60	150	300
18	10	6	60	150	300
12	9	6	60	150	300
9	8	6	60	150	300

A Table shewing how much Rope is taken as strapping for a number of double blocks.

Size of blocks.	Size of rope.	for 1 gun 3 blocks.		for 10 guns 30 blocks		for 25 guns 75 blocks.		for 50 guns 150 blocks	
Inches.	Inches.	faths.	feet.	faths.	feet.	faths.	feet.	faths.	feet.
12	3½	2	2¼	23	4½	59	2¼	118	4½
11	3¼	2	1¼	22	5½	57	1¾	114	3½
10	3	2	1	22	0½	55	1¼	110	2½
9	2¾	2	1¼	21	4	54	1	103	2
8	2½	2	0¾	21	1½	53	04	106	1½

A Table shewing how much Spun-yarn is taken to serve a number of double block straps.

Double blocks.	Size of spun-yarn.	1 gun.		10 guns.		25 guns.		50 guns.	
Inches.	Yarn.	lbs.	ozs.	lbs.	ozs.	lbs.	ozs.	lbs.	ozs.
12	2	3	0	30	0	75	0	150	0
11	2	3	0	30	0	75	0	150	0
10	2	3	0	30	0	75	0	150	0
8	2	2	4	22	4	55	10	111	4
9	2	2	4	22	4	55	10	111	4

TABLES ON LONG GUNS AND CARRONADES.

A Table shewing how much Housline is taken to seize in a certain number of blocks.

blocks.	Size of seizing.	3 blocks.	30 blocks	75 blocks	150 blocks
Inches.	H.	fath. feet.	fath. feet.	fath. feet.	fath. feet.
12	H.	5 0	50 0	125 0	250 0
11	H.	4 5¼	49 3½	123 5¾	247 5½
10	H.	4 5¼	48 4½	121 5¼	243 4½
9	H.	4 5	48 2	120 5	241 4
8	H.	4 5	48 2	120 5	241 4

A Table shewing how much Rope is taken as strapping for a number of single blocks.

Single blocks.	Size of straps.	for 1 gun 3 blocks.	for10guns 30 blocks.	for 25 guns 75 blocks.	for 50 guns 150 blocks.
Inches.	Inches.	fath. feet.	fath.feet.	fath. feet.	fath. feet.
12	3½	2 0	20 0	50 0	100 0
11	3½	2 0	20 0	50 0	100 0
10	3	2 0	20 0	50 0	100 0
9	2¾	1 5½	19 1	47 5½	95 5
8	2½	1 5¼	18 4½	46 5¼	93 4½

A Table shewing how much Spun-yarn is taken to serve a number of single block straps.

Single blocks.	Size spun-yarn.	for 3 straps.	for 30 straps.	for 75 straps.	for 150 straps.
Inches.	2-yarn.	lbs. ozs.	lbs. ozs.	lbs. ozs.	lbs.ozs.
12	2	2 4	22 8	56 4	112 8
11	0	2 4	22 8	56 4	112 8
10	0	2 4	22 8	56 4	112 8
9	0	1 8	15 0	37 8	75 0
8	0	1 8	15 0	37 8	75 0

those hoses to be filled with portfire composition; after they are filled set fire to one of them, and by a watch, take particular notice to see how long it burns; then take a stick of portfire and measure it by rule, and set fire to it, so as to tell how many minutes or seconds it will burn of the same composition; then prime those wooden tubes with powder mixed with linseed oil; then bore a hole in the magazine scuttle the bigness of the hose; also the magazine doors; put your tube in one of the powder barrels filled; get some putty, so as to putty all round the holes in the doors, the length of the hose below the first scuttle of the magazine passage is not counted, on account there might be some loose powder in the passage and thereby go off before the time appointed; stop your hose up all along the beams and carlines; bore a hole through the ship's side the diameter of the hose, as high from the water as you wish it; the lower end of the hose from the ship put such a quantity of portfires as you wish:—sometimes ship's are set off from the bows, from the side and from the stern; the safest way is from the bows if you have time.

Composition for dipping Reeds, Bavins and Curtains.

	lbs.		lbs.
Rosin, - -	120	Coarse Sulphur,	90
Swedish Pitch, -	60	Tallow, -	6
Mealed Powder, -	12		

Composition for Blacking Guns.

	lbs.		lbs.
Black lead, -	20	Red lead, -	10
Lampblack, -	1½	Linseed oil, -	18 gals.

TABLES ON LONG GUNS AND CARRONADES.

A Table shewing the quantity of Houslin taken to seize in a number of blocks.

Blocks.	Size of Seizing.	for 3 blocks.		for 30 blocks.		for 75 blocks.		for 150 blocks.	
Inches.	H.	fath.	feet.	fath.	feet.	fath.	feet.	fath.	feet.
8	H.	4	2	43	2	108	2	216	4
7	M.	4	2	43	2	108	2	216	4
6	M.	4	2	43	2	108	2	216	4
6	M.	4	2	43	2	108	2	216	4
6	M.	4	2	43	2	108	2	216	4

A Table shewing the quantity of Rope taken to strap a certain number of single blocks.

Single blocks.	Size of straps.	for 3 blocks.		for 30 blocks.		for 75 blocks.		for 150 blocks.	
Inches.	Inches.	fath.	feet.	fath.	feet.	fath.	feet.	fath.	feet.
8	2¼	2	0	20	0	50	0	100	0
7	2¼	1	3	15	0	37	3	75	0
6	2	1	3	15	0	37	3	75	0
6	2	1	3	15	0	37	3	75	0
6	2	1	3	15	0	37	3	75	0

A Table shewing the quantity of Spun-yarn taken to serve a number of single block straps.

blocks.	Size of spun-yarn	for 3 straps.		for 30 straps.		for 75 straps.		for 150 straps.	
Inches.	Yarn.	lbs.	ozs.	lbs.	ozs.	lbs.	ozs.	lbs.	ozs.
8	2	1	8	15	0	37	8	75	0
7	0	1	8	15	0	37	8	75	0
6	0	1	8	15	0	37	8	75	0
6	0	1	8	15	0	37	8	75	0
6	0	1	8	15	0	37	8	75	0

OF SALUTES.

Art. 1st. A Commodore, when acting on separate service by order of the Secretary of the Navy, and not otherwise, shall receive the salute of 13 guns.

Art. 2nd. The salute of a Commodore, when not on separate service by order of the Secretary of the Navy, shall be 9 guns.

Art. 3rd. Officers of the same rank are to return the salute of each other with the same number of guns.

Art. 4th. The salute of a Captain is to be returned with 7 guns. The salute of Officers of superior rank to that of Captain is to be returned with the number of guns to which their rank entitles them.

Art. 5th. When more than one ship salutes the Commander of a fleet or squadron, he will not return it until all the ships shall have ceased firing, and he will then fire the salute of an officer of his rank.

Art. 6th. The Commander of a fleet or squadron only is to be saluted.

Art. 7th. When two squadrons meet the Officers only who command them are to salute.

Art. 8th. An Officer appointed to Command in Chief shall be saluted on hoisting his flag by all the ships under his command, unless an Officer Senior to him be present, in which case they are to salute him as soon as he shall be separated from such senior officer.

Art. 9th. Commanders are not to be saluted by such Officers as have not been separated from them six calendar months.

Art. 10th. When the President shall visit a ship of the United States' Navy, he is to be saluted by them with 21 guns.

OF SALUTES.

Art. 11th. The Vice-President shall be saluted with 19 guns.

Art. 12th. The Secretary of the Navy and the other Heads of Departments, Governors of States or Territories, and Foreign Ministers, are to be saluted with 17 guns.

Art. 13th. Major Generals are to be saluted with 15 guns.—Brigadier Generals with 13 guns.

Art. 14th. When a Public Character high in rank shall embark on board of any of the United States' ships of war, he may be saluted with 13 guns.

Art. 15th. When a Commanding Officer anchors in a foreign port, he is to inform himself what salutes have been usually given or received by Officers of his rank of other nations, and he is to insist on receiving the same mark of respect. Captains may salute foreign Ports with such a number of guns as may have been customary, on receiving an assurance that an equal number shall be returned; but without such assurance, they are never to salute.

Art. 16th. Foreigners of distinction, on visiting the United States' ships of war are to be saluted with such a number of guns as may suit their rank and quality.

Art. 17th. The Anniversary of American Independence, and the Birth of General Washington, are to be celebrated by salutes of 17 guns from every vessel in port, of the rate of a sloop of war and upwards.

Art. 18th. Forts or Castles in the United States are not to be saluted by the United States' ships of war.

Art. 19th. United States' ships of war are not to strike their top-sails, nor take in their flags in any part of the world to any foreign ship or ships, unless such foreign ship or ships shall have first struck, or shall at the same time

strike their flags or top-sails to ships of the United States; nor are they within the limits and jurisdiction of the United States, to salute any foreign ships whatever.

Art. 20th. Captains are not to salute; they are however to return the salutes of foreign ships with an equal number of guns.

Art. 21st. If a Commander of a Squadron should die, when on actual service, his colors shall be lowered half-mast, and continue so until he is buried: minute guns, to the number his rank entitles him to, shall be fired from each of the ships present—beginning at the putting of the corpse into the sea, or when it is put off from the ship to the shore.

22nd. If a Captain shall die, the ship he commanded shall wear her colors half-mast, and a salute of nine minute guns shall be fired from the ship, commencing as in the preceding article.

Art. 23d. If a Lieutenant should die, three volleys o musquets shall be fired at his funeral.

COMPOSITION FOR THE BEST OF SKY ROCKETS.

For half pound Rockets.

	lbs.	ozs.		lbs.	ozs.
Saltpetre, -	4	9	Sulphur, -	1	0
Charcoal, -	1	8			

Another Composition for Sky Rockets.

For four ounce Rockets.

	ozs.		ozs.
Saltpetre, -	8	Salphur, - -	2
Charcoal, -	3		

COMPOSITION FOR ROCKETS, PORTFIRES, LIGHTS, *&c.*

Another Composition.

For 1lb. Rockets.

	lbs.	ozs.		lbs.	ozs.
Saltpetre, -	5	0	Sulphur, -	1	8
Charcoal, -	1	4			

Another Composition for Rockets.

	lbs.	ozs.		lbs.	ozs.
Saltpetre, -	2	4	Sulphur, -	0	12
Charcoal, -	2	0			

Another Composition for Rockets.

	lbs.	ozs.		lbs.	ozs.
Saltpetre, -	4	4	Sulphur, -	0	12
Charcoal, -	2	0			

English Rockets.

	lbs.	ozs.		lbs.	ozs.
Saltpetre, -	4	0	Sulphur, -	1	0
Charcoal, -	1	8	Mealed powder,	0	4

Another Receipt.

Saltpetre, -	4	2	Sulphur, -	1	7
Charcoal, -	1	7			

The powder used for those rockets must be a fine strong powder, refined saltpetre, and the best fine brimstone and ma-

ple charcoal, those articles to be pulverized separately and passed through a double headed sieve, then to be mixed into a mealing pan two or three times over before it be put into a carcase—it takes 4½ sheets of paper for a half ounce rocket.

Composition for the best dried Portfire.

	lbs.		lbs.
Saltpetre, - -	4	Sulphur, - -	1
Mealed powder, -	2	Antimony, -	1

Composition for moist Portfire.

	lbs.		lbs.
Saltpetre, - -	6	Sulphur, - -	2
Mealed powder, -	1	to be moistened with linseed oil.	

Composition for common Portfires.

	ozs.		ozs.
Mealed powder, -	8	Sulphur, - -	8
Saltpetre, - -	4		

Composition for slow Portfires.

	lbs.	ozs.		lbs.	ozs.
Saltpetre, -	4	0	Sulphur, -	1	6
Mealed powder,	1	4			

COMPOSITION FOR ROCKETS, PORTFIRES, LIGHTS, &c.

Another Composition for Portfires.

	lbs.	ozs.		lbs.	ozs.
Saltpetre, -	5	8	Sulphur, -	1	4
Mealed powder,	1	4			

Substitute for Portfires.

Two ounces of nitre dissolved in one gallon of water, and sheets of soft brown paper dissolved therein; these when dry are rolled up to about the size of a common portfire, then paste the edge for use.

Composition for False Fires, the best.

	lbs.		lbs.
Mealed powder, -	2	Saltpetre, -	2
Sulphur, - -	1	Charcoal, -	1

Composition for False Fires.

	lbs.		lbs.
Saltpetre, - -	6	Sulphur, - -	5
Charcoal, - -	8		

Another Composition for False Fires.

	ozs.		ozs.
Mealed powder, -	8	Saltpetre, -	8
Sulphur, - -	4		

COMPOSITION FOR ROCKETS, PORTFIRES, LIGHTS, &c.

Another Composition for False Fires.

	lbs.	ozs.		lbs.	ozs.
Saltpetre, -	4	8	Sulphur, -	1	8
Yellow orpiment,	0	3	Antimony, -	0	8

False Fires.

Take your proportions of composition and mix them together on a table, then unite them through a fine hair sieve and 13 inches fuze, the bore to be 9½ inches in length and 1 5-8 of an inch in diameter, and decreasing gradually to the other end; drive it 4 inches with clay, and set home the composition gently upon the top of it with a stick that will fit the bore, when quite full prime them with mealed powder and cover them with paper.

Composition for Blue Lights.

	lbs.	ozs.		ozs.
Saltpetre, -	1	0	Sulphur, - -	8
Yellow arsenic	0	2		

Another Receipt.

	lbs.	ozs.		ozs.
Saltpetre, -	1	2	Sulphur, - -	4
Yellow orpiment,	0	1	Antimony, - -	12

Another Receipt.

	lbs.	ozs.	drs.		lbs.	ozs.
Saltpetre, -	1	0	0	Sulphur, -	0	4
Yellow orpiment,	0	0	12	Antimony, -	1	2

COMPOSITION FOR ROCKETS, PORTFIRES, LIGHTS, &c.

French Blue Lights.

	lbs.ozs.
Saltpetre,	1 0
Sulphur,	0 12
Yellow orpiment,	3 6
Glass pulverized,	0 6
Pulverized powder,	0 1

Receipt for Blue Lights.

	lbs. ozs.		lbs.ozs.
Saltpetre,	12 8	Sulphur,	3 8
Charcoal,	1 8	Indigo,	0 2
Yellow orpiment,	0 4	Dry verdigrise,	0 2
Fine brass or copper filings,	0 1		

Bengal Blue Lights.

	lbs.ozs.		lbs.ozs.
Saltpetre,	7 0	Sulphur,	1 12
Red orpiment,	0 8		

Another Receipt.

	lbs.ozs.		lbs.ozs.
Saltpetre,	2 4	Sulphur,	0 8
Antimony,	0 4	Yellow orpiment,	0 1½

Composition for English Blue Lights.

	lbs.ozs.		lbs.ozs.
Saltpetre,	1 4	Sulphur,	1 5
Antimony,	0 7	Mealed powder,	0 1

COMPOSITION FOR ROCKETS, PORTFIRES, LIGHTS, &c.

Composition for Chinese Blue Lights, having found those the best.

	lbs.	ozs.		lbs.	ozs.
Saltpetre, -	1	0	Sulphur, -	0	8
Yellow arsenic,	0	2	Indigo, -	0	½
Mealed Powder,	0	1	Camphor, -	0	1

Composition for Red Fires.

	lbs.	ozs.		lbs.	ozs.
Saltpetre, -	4	0	Charcoal, -	2	8

Brilliant Fire.

	lbs.	ozs.		lbs.	ozs.
Mealed powder, -	2	8	Sulphur, -	0	2
Saltpetre, - -	0	6	Salt dust, -	0	6

Composition of strong Fire for Smoke Balls.

	lbs.	ozs.		lbs.	ozs.
Corned powder, -	1	0	Saltpetre, -	0	6
Pitch, - -	0	8	Tallow, -	6	0
Seal coal, - -	0	6	Sulphur, -	0	2

This composition to be mixed well two or three times and moistened with linseed oil.

Composition of slow Fire for Smoke Balls.

	lbs.	ozs.		lbs.	ozs.
Corned powder, -	1	8	Pitch, -	1	0
Saltpetre, - -	0	8	Seal coal, -	0	4
Tallow, - -	0	4			

COMPOSITION FOR ROCKETS, PORTFIRES, LIGHTS, &c.

Composition for peculiar Fires.

Aqua Fortis,	1 gill.	Vitriol,	1 gill.
Spirits of wine,	1 do.	Gum Arabac,	1 oz.
Asafœtida,	1 oz.	Yellow orpiment,	½ do.
Camphor,	1 do.	Red orpiment,	1 do.
Sal Armoniac,	½ do.		

Fire Composition.

	lbs.		lbs.
Pitch,	9	Tallow,	2
Powder,	18	Saltpetre,	2
Sulphur,	5		

This composition is mixed together after the fusile ingredients have been melted together over the fire, they are preserved when prepared in whole lumps with milled powder.

Composition for a slow White Flame.

	lbs.		lbs.
Saltpetre,	2	Sulphur,	3
Antimony,	1		

Composition for large drove Stars.

	lbs.	ozs.		lbs.	ozs.
Saltpetre,	4	0	Sulphur,	2	0
Mealed powder,	2	0	Antimony,	0	2
Saw dust,	0	2	Glass dust,	0	1

COMPOSITION FOR ROCKETS, PORTFIRES, LIGHTS, &c.

Composition for drove Stars.

	lbs.	ozs.
Saltpetre,	8	0
Sulphur,	2	0
Mealed powder,	2	0
Antimony,	0	8

NOTE—This to be mixed with oil of spike.

Composition for Rolled Stars.

	lbs.ozs.		lbs.ozs.
Sulphur,	2 0	Saltpetre,	2 0
Antimony,	2 0	Isinglass,	0 1½
Spirits of wine,	2 quarts.	Vinegar,	2 quarts.

Another Composition for Rolled Stars.

	lbs.ozs.		lbs.ozs.
Saltpetre,	8 0	Sulphur,	2 0
Antimony,	2 0	Mealed powder,	0 8
Isinglass dissolved,	0 1½	Spirits of wine,	1 pint.
Vinegar,	1 quart.		

Composition for Brilliant Stars.

	lbs.ozs.		lbs.ozs.
Mealed powder,	2 0	Sulphur,	0 2
Saltpetre,	0 3	Steel dust,	0 6

COMPOSITION FOR ROCKETS, PORTFIRES, LIGHTS, &c.

Another Composition for Brilliant Stars.

	ozs.drs.		ozs.drs.
Saltpetre, -	3 8	Sulphur, -	0 1
Mealed powder,	12 0		

To be worked with spirits of wine.

Composition for White Stars.

	ozs.		ozs.
Mealed powder, -	4	Sulphur, -	6
Saltpetre, - -	12	Oil of spike, -	2
Camphor, - -	5		

Composition for Blue Stars.

	ozs.		ozs.
Mealed powder, -	8	Saltpetre, -	4
Spirits of wine, -	2	Oil of spike, -	2
Sulphur, - -	2		

Composition for Variegated Stars.

	ozs.drs.		ozs.
Mealed powder, -	0 8	Rockpetre, -	4
Sulphur vicum, -	2 0	Camphor, -	2

Composition of Tail Stars.

	ozs.		ozs.drs.
Meal powder,	3	Brimstone, - -	2 0
Sulphur,	1	Charcoal roughly ground,	0 12

COMPOSITION FOR ROCKETS, PORTFIRES, LIGHTS, &c.

Composition for Mould Stars.

	lbs.	ozs.		lbs.	ozs.
Gum Arabic, -	2	0	Antimony, -	0	10
Mealed powder,	0	3	Sulphur, -	0	11
Saltpetre, -	3	0			

Composition for Common Stars.

	lbs.	ozs.		ozs.
Mealed saltpetre,	1	0	Isinglass, -	4
Spirits of wine, -	0	1	Camphor, -	2
Antimony, - -	0	2	Brimstone, -	4

Brilliant Composition.

	lbs.	ozs.		ozs.
Steel filings, -	1	8	Sulphur, -	4
Saltpetre, - -	1	1		

Composition for Case Stars.

	lbs.		lbs.
Sulphur, - -	2	Saltpetre, - -	6
Mealed powder, -	12		

RULE.

To be mixed well together and run through a fine hair sieve, then drive the composition into a cantoon case about 8 inches long, and to be clayed at the bottom about ¼ of an

inch from the cheek, then drive with the composition to the top, leaving some for to clay it; then bore 5 holes to the bottom, just above the cheek at an equal distance from each other, and likewise from the cheek, keeping as far from the clay as you can; then a piece of quick match must go in each hole, that the fire may commence catching to the whole at once.

Composition for Amber Lights.

	lbs.		lbs.
Mealed powder, -	9	Amber, - -	3

Amber lights are a species of Artificial fire works, driven and contained in a small case for illumination.

Another Composition.

	lbs.		lbs. ozs.
Saltpetre, - -	3	Sulphur, -	1 0
Mealed powder, -	1	Antimony, -	0 1½

Note.—Both of these compositions to mix with the oil of spike.

Composition for Flaming Lights.

	lbs.ozs.		lbs.ozs.
Mealed powder, -	6 0	Charcoal, -	8 0
Saltpetre, - -	0 8	Sulphur, -	2 8

Composition for Globe Lights.

	ozs.		ozs.
Saltpetre, - -	15	Sulphur, - -	5
Mealed powder, -	6		

Note—To be rolled as a star.

COMPOSITION FOR ROCKETS, PORTFIRES, LIGHTS, &c.

Light Composition.

	lbs.		lbs.
Saltpetre, - -	8	Sulphur, - -	4
Antimony, - -	1		

Sometimes they are made with other proportions, together with some mealed and grained powder.

Composition of Fire and Light Balls.

They are composed or filled with an illumination or inflammable composition; the light balls are for giving a strong light on objects at a distance.

	lbs.ozs.		lbs.ozs.
Mealed powder, -	2 0	Sulphur, -	1 0
Rosin, - - -	1 0	Turpentine, -	2 8
Saltpetre, - -	1 8		

Balls are then formed of a proper size, and then a coat of mealed powder is applied.

Composition of Fire and Light Balls.

Take thick brown paper to the size of the mortar filled with the following composition—

	lbs.		lbs.
Sulphur, - -	5	Rosin, - -	5
Mealed powder, -	5		

Which being well mixed and put in warm, will produce a clear fire and burn some time.

COMPOSITION FOR ROCKETS, PORTFIRES, LIGHTS, &c.

Composition for Fire Balls.

	lbs.ozs.		lbs.ozs.
Rosin, - -	5 8	Sulphur, -	3 0
Allum powder, -	1 8	Starch, -	0 8
Saltpetre, - -	4 6	Mealed powder,	8 0
Linseed oil, -	1 gill.	Oil of spike, -	1 pint.

COMBUSTIBLE COMPOSITION FOR DESTROYING OBJECTS OR GIVING ALARM.

Composition for a Fire Pot that cannot be extinguished by Water.

	lbs.ozs.drs.		lbs.ozs.drs.
Common powder,	2 0 0	Salt-nitre,	2 0 0
Camphor, -	0 0 2	Rosin, -	0 0 4
Sal Armoniac, -	0 0 4		

Having well incorporated the above ingredients, wet them with linseed oil and form them into balls.

Composition for Smoke Balls.

	lbs.		lbs.
Corned powder, - -	12	Pitch, - -	2
Saltpetre, - - -	4	Tallow, -	5
Charcoal, - - -	1		

Rule for making Smoke Balls.

The corned powder to be spread on a table, the saltpetre to be put in a sieve and sifted and then well mixed together; the pitch and tallow to be put in an iron pot over a charcoal

fire and kept stirring until dissolved and made very hot; then into a pan about 13 inches in diameter, and to receive this, there must be a copper to hold hot water about 2 feet 6 inches diameter, to keep the composition warm, then put in the powder and saltpetre and let them be well mixed together.

Note—Rub your hands with tallow when filling the shells that the composition may not stick to your hands.

Composition for Fire Balls to set fire to Buildings, &c. &c.

	lbs.		lbs.
Mealed powder, -	10	Saltpetre, -	2
Sulphur, - -	4	Rosin, - -	1

Another Composition for Fire Balls to set fire to Buildings.

	lbs.		lbs.
Mealed powder, -	40	Saltpetre. -	32
Sulphur, - -	16	Rosin, - -	4
Steel or iron filings, -	2	Sawdust boiled in lye,	2
Charcoal of birch wood,	1		

Composition for Fire Hoops, Fire Arrows and Lances.

	lbs.ozs.		lbs.
Mealed powder, -	1 0	Saltpetre, -	3
Sulphur, - -	0 8	Linseed oil, ½ a pint.	

Composition for Suffocating Pots.

	lbs.		lbs.
Sulphur, - -	6	Saltpetre, - -	5

Composition for Thunder Powder.

	lbs.		lb.
Saltpetre, - -	3	Sulphur, - -	1
Salt of tartar, -	1		

Composition for Stink Balls.

	lbs.		lbs.
Mealed powder, -	10	Saltpetre, - -	2
Sulphur, - -	4	Pitch, - - -	8
Rasped horses hoof, -	6	Asafœtida, - -	8

To make an Artificial Earthquake.

	lbs.		lbs.
Sulphur, - -	15	Iron filings, -	15

Knead them together in common water until they become as stiff as paste—this being buried in the ground, will in 8 or 10 hours time burst out into flames and cause the earth to tremble all around to a considerable distance.

To produce Fire from two cold Liquors.

Mix together two drachms of the oil of cloves and two and a half drachms of spirit of nitre, made with the oil of vitriol, let the mixture be made by pouring the acid at once on the essential oil and they will instantly take fire—if the spirit of nitre be made according to the following directions it will never fail to take fire—Let a quantity of purified nitre remain some time in a warm place, that it may be perfectly dried, pound in a gross powder, and put in the same place again to be dried perfectly; then put in a glass

retort, 1lb. and 1 oz. of this salt, and 1lb. and 1 oz. of good oil of vitriol, lay on a received and set the retort in a sand furnace; make but a gentle fire and raise it gradually; but never let it be higher than is just sufficient, for during over this the spirits, the distillation being finished, keep the spirits carefully stopped up.

Note—This will never fail of firing the oil of cloves, nor is that expensive oil, for the experiment, for it will, thus made, fire almost any of the vegetable oils or animal oil either.

Rule for making Phosphorus of Lime.

Reduce to powder 6 ozs. of crude sal armoniac, and mix it with 13 ozs. of lime that has been slacked, then mix them well together, and put them in a crucible big enough to hold twice the quantity; melt them together on a strong fire, and as the matter swells and rises up stir it with a spatula when it runs perfectly in every part; remove it from the fire and pour it into the bottom of a mortar, let it cool, and preserve it in a wide mould glass bottle well stopped.

Note—At any time when a piece of this is struck upon with a hammer it takes fire and burns as it breaks asunder under the blow.

To make Alum Phosphorus.

Reduce to fine powder 2lbs. of alum and mix it with 2 ozs. of wheat flour, grind these together, and put the powder into an iron ladle, set it over the fire and it will melt; keep stirring it about till it coviates and crudes into a dry mass again, then reduce it a second time to powder; put this into a ladle and put it on the fire again, until it be of a dark brown color, nearly black; then remove this from

the fire and put the powder into a large phial, set this upon a little sand in a crucible and pour sand about it; then set it on a naked fire and make the bottom of the crucible red hot; keep the fire at this degree for 20 minutes, after this stop the phial with a cork, and then remove the crucible from the fire, and let all cool; then take the phial out of the sand and put it in a dark place: this is the alum phosphorus, or as some call it the black phosphorus—at any time if a little of this powder be poured out of the bottle, it takes fire of itself and burns away to a coal cinder. The best method of shewing its effect is by pouring it out upon a coarse paper which has been hung up in a damp place.

Solder for Gold.

Melt copper 1lb., fine silver one part, gold two parts, add a little borax when it is just melted, then pour it out immediately.

Solder for Silver.

Melt fine silver two parts, brass one part, do not keep them long in firing least the brass fly away in the flames.

Solder for Tin.

Take four parts of pewter, one part of tin and one part of bismouth, melt them together and run them into narrow lengths and it is done.

Solder of Iron.

Nothing here is necessary but good tough brass and borax applied mixed with water to the consistence of paste.

Solder for Lead.

Take two parts of water lead and one part of tin, its goodness is tried by melting it and pouring the size of a crown piece upon a table, then if it be good there will arise small bright stars or beads on it. Apply rosin when you use it.

To prove Spirits of Wine.

Take a little in a spoon and put a little gunpowder in it and set fire to it, if it burns and the powder takes fire it is good.

To make the best drying Oil.

Mix 1lb. of letharge of gold to every 6 gallons of oil, boil it over a slow fire, but not too much, least it prove too thick and be unserviceable.

A cement for broken Pots or Glasses.

Take quick lime, glare of eggs and old thick varnish, grind and temper them well together, it is then ready for use.

To take Ink out of any kind of Cloth.

Fill a pewter pot with boiling water and apply the cloth to the side of the pot, then rub a lime or lemon cut in pieces over it and the ink disappears.

Composition for Blacking Hammock Cloths.

	lbs.		lbs.
Bees-wax, - -	20	Rosin, - -	4
Spirits of turpentine, -	2 gals.	Lampblack, -	6
Paint oil, - -	1 gallon.		

Boil them well together and keep it warm while putting on.

Note—To be primed first with lead colored paint.

Another Composition for Hammock Cloths.

	lbs.		lbs.
Yellow ocre, -	48	Black paint, -	8
Soap, - - -		Fresh water, 8 pints.	

Another Receipt for Hammock Cloths.

	lb.		lbs.
Black paint, -	½	Yellow ocre, - - -	3
Soap, - -	½	Fresh water, -	¾ of a gill.

Another Composition for Hammock Cloths.

	lbs.		
Black paint, - -	80	Linseed oil, -	10 galls.
Bees wax, - -	10	Letharge, -	5 lbs.
Spirits of turpentine, - - - -			1 gal.

Composition for making Black Varnish.

Spirits of turpentine, 1 gallon, Rosin, 1lb. 4 ozs.
Lampblack, - 1lb. 4 ozs. Linseed oil, 1 quart.
To be boiled on a slow fire for half an hour, then used or laid on when cold.

Note—The black paint must be well ground.

INSTRUCTIONS FOR A GUNNER IN THE UNITED STATES' NAVY.

[*By Order of the Board of Navy Commissioners.*]

Art. 1st. The gunner having received directions for that purpose from the captain, is to inform the officers of the ordnance, having charge thereof, when the ship will be ready to receive her guns; he is to attend to see them on board,

and to see that every gun is put into its proper place and carriage, and placed in its proper port:—No. 1, being the foremost gun on the larboard side, and No. 2, the foremost gun on the starboard side.

Art. 2nd. He is whenever other duties will admit to employ his mates and the men of his crew in fitting the breeching and tackles, that they may be ready for the gun when received on board.

Art. 3rd. He is to examine very carefully into the state of the magazine, that he may be certain of its being perfectly fitted and perfectly dry, before the powder is carried on board; but if he should find any appearance of dampness, he is to report it to the captain, that it may be properly dried.

Art. 4th. He is to inform the captain when the powder will be ready to be sent on boad, that the fire in the galley may be put out, before the vessel that carries it is suffered to come along side; while the powder is taken into the ship, no candles are to be kept lighted, except those in the light room; nor is any man allowed to smoke tobacco.—As soon as the whole is stored in the magazine, the gunner is to see the doors, the light room and the scuttle, carefully secured, and is to deliver the keys to the captain, or such other officer as he shall appoint to take care of them.

Art. 5th. He is never to go into the magazine without being ordered.—He is never to allow the doors of the magazine to be opened by any but himself.—He is not to open them until the proper officers are in the light room; and he is to be very careful in observing that the men who go into the magazine have not any thing about them which can strike fire.

INSTRUCTIONS FOR A GUNNER IN THE U. S. NAVY.

Art. 6th. He is never to keep any quantity of powder in any other part of the ship then the magazine, except that which the captain shall order to be kept in the powder boxes, or powder horns on deck; and when he delivers cartridges from the magazine, he is to be very particular that they are in cases properly shut.—And whenever it may be necessary to remove powder from the ship, he is to use the utmost caution, that the passages to the magazine may be wetted, so as to prevent accidents.

Art. 7th. He is to turn the barrels of powder once at least in every three months, to prevent the separation of the nitre, from the other ingredients of the powder.—He is also to examine frequently the barrels, and if he should find any of them defective, he is to remove the powder into some of the barrels which have been emptied.—He is frequently to examine the cartridges which are filled, that he may remove the powder from any of them which he may find defective.

Art. 8th. When powder of various qualities be sent on board, he is to be very attentive in using them in the order which shall be prescribed.

Art. 9th. When any extra quantities of stores or ammunition is supplied for foreign service, he is to be careful to use those first which have been the longest time on board, unless he shall receive particular directions to the contrary.

Art. 10th. He is frequently to examine into the state of the guns, their locks and carriages, that they may be immediately repaired or exchanged if found defective—and he is frequently to examine the musketry and all the other small arms, to see that they are kept clean, and in every respect fit for service.

Art. 11. He is to be attentive in keeping the shot-racks full of shot, the powder horns and boxes of priming tubes full, and a sufficient quantity of match primed and ready for being lighted at the shortest notice.

Art. 12th. Guns received from the ordnance stores shall be scaled before they are loaded for service, and if it shall be necessary to scale them at any other time, the gunner shall represent to the captain, who is to give an order for that purpose, in which the cause of its being done is to be particularly specified.

Art. 13th. When a ship is preparing for battle, he is to be particularly attentive to see all the quarters are supplied with every thing necessary for the guns, the boarders, firemen, &c. &c.—He is to see all the skreens thoroughly wetted and hung round the hatchways, and from them to the magazine doors before he opens them.

Art. 14th. He is during an action to take all opportunities of filling powder, that there may be no cessation of firing for want of ammunition—and he is to be attentive to send out cartridges with the quantity of powder reduced or increased as the captain shall have directed.

Art. 15th. After the engagement he is to apply to the captain for a survey on the powder, shot and other stores remaining under his charge, that the quantity expended in the engagement may be ascertained.

Art. 16th. He is to be careful in keeping the boxes of hand grenades and grape shot in dry places, and to expose frequently the grape shot to the sun and wind, to prevent the bags from being mildewed.—He is never to start the hand grenades, but is to return those which are not used in the boxes in which he received them.

INSTRUCTIONS FOR A GUNNER IN THE U. S. NAVY.

Art. 17th. He is never to allow any match to be burnt in the day, nor more than two lights at the same time in the night, without an order from the captain.—When a match is burning it is always to hang over water in tubs, and the gunner's mate of the watch is to attend it.

Art. 18th. If a detachment of seamen or marines shall at any time be sent from the ship, the gunner is to make out an inventory of arms, ammunition and stores, which are sent with it, which is to be signed by the officer appointed to command the detachment, and to be witnessed by the captain's clerk, who is to examine the quantity supplied—and on the return of the detachment, the gunner, in presence of the officer who commanded it, and the captain's clerk, is to examine the arms, &c. that are brought back, and to report the deficiency, if any, in each article to the captain, who from the manner in which the officer shall account for such deficiency, will determine whether it be proper to allow the article to be expended by the gunner, in his account, or charged against the pay of the officer or any person under him, by whose carelessness or misconduct, the whole or any part of them was lost or destroyed.

Art. 19th. When a salute is to be fired, the gunner is to be very attentive to take such precautions in drawing the guns as may insure there not being a shot in any of them—and if vessels of any description be so near as to risk their being damaged by the wads, he is to draw them also, and he is to lay up and point the guns so as to prevent their doing any mischief—although a wad or shot notwithstanding the precaution taken, may have been left in one of them.

Art. 20th. He is to take every possible precaution to prevent any ball cartridges being given to the men among the blank cartridges issued for exercise.

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Art. 20th. He is to take every possible precaution to prevent any ball cartridges being given to the men among the blank cartridges issued for exercise.

INSTRUCTIONS FOR A GUNNER IN THE U. S. NAVY.

Art. 21st. Whenever he shall be directed to strike any guns in the hold, he is to pay them all over with a thick coat of warm tar and tallow mixed together; having washed the bore of the gun with fresh water, and carefully spunged and dried the gun inside, he is to put a good full wad, dipt in the same mixture, about a foot within the muzzle, and to see that the tompion is well driven in and surrounded with putty, and he is to drive a wooden stopper tight into the vent and secure it there.

Art. 22d. He is to be extremely attentive in examining all the guns, in seeing them carefully drawn and throughly spunged before they are returned into store.—He is also to examine very carefully the magazine, to see that no loose powder remains in any part of it, after the powder has been returned into store.—He is also to be careful that there are no cartridges left in the cartouch boxes when they are sent on shore.

Art. 23rd. He is to be very attentive to the armorer and his mates, and to see that they discharge their duty properly—that they keep the musquets and other small arms clean and in good order, always repairing them when they are defective, and not suffering them through neglect to become too bad to be repaired

Art. 24th. If from any extraordinary circumstances when a ship is on a foreign station, the small arms should be so damaged, that they cannot be cleaned or repaired by the armorer, the gunner is to represent their condition to the captain, who is to direct a lieutenant and the master to survey them—and if their report shall confirm the representation of the gunner, he is to apply to the commander in chief to give orders for their being repaired:—but if the

commander in chief be not present, the captain is himself to get them repaired by workmen on shore—being very careful not to pay more for their repairs, than the established prices of the country. The gunner is to attend frequently and the armorer constantly, to see that the work is properly done.

Art. 25th. As the brass sheaves and iron pins of blocks, for gun tackles, from being much exposed to salt water, are frequently set fast with rust, he is to be particularly attentive when this is the case, to cause the iron pins to be knocked out and to be oiled or greased.

Form of an Order.

Required from the Gunner's Department, One double block and a seizing for ditto, for the use of the second division,

Approved,

Gunner.

Deliver the above articles from the Gunner's Department.

Approved,

Lieut.

The number of Ropes called Ropes on board a Ship of War.

Back Rope,	1.	Mast Rope,	17.
Buck Rope,	2.	Match Rope,	18.
Bell Rope,	3.	Man Rope,	19.
Breast Rope,	4.	Ridge Rope,	20.
Buoy Rope,	5.	Rudder Rope,	21.
Cob Rope,	6.	Ring Rope,	22.
Clue Rope,	7.	Stage Rope,	23.
Foot Rope,	8.	Swab Rope,	24.
Grab Rope,	9.	Slew Rope,	25.
Hook Rope,	10.	Train Rope,	26.
Hawse Rope,	11.	Top Rope,	27.
Heel Rope,	12.	Trip Rope,	28.
Head Rope,	13.	Tow Rope,	29.
Jaw Rope,	14.	Wheel Rope,	30.
Limber Rope,	15.	Yard Rope,	31.
Knee Rope,	16.		

To take Paint out of Cloth.

Make a strong solution of pot or pearl ashes and steep the painted part in it for four hours, then wash it with soap suds and it will disappear.

This book should
the Library on or before the
stamped below.
A fine ~~of five cents a day~~ is incur
by retaining it beyond the specifi
time.
Please return promptly.

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